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THE EXECUTIVE DOCUMENTS

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THE HOUSE OF REPRESENTATIVES

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DURING THE

ND STATES

ND SESSION OF THE FORTY-SEVENTH

CONGRESS.

1871-'72.

IN SEVENTEEN VOLUMES

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REPORT

OF

THE SECRETARY OF WAR,

BEING PART OF

THE MESSAGE AND DOCUMENTS

COMMUNICATED TO THE

TWO HOUSES OF CONGRESS

AT THE

BEGINNING OF THE SECOND SESSION OF THE FORTY-SECOND CONGRESS.

VOLUME I.

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REPORT

OF

THE SECRETARY OF WAR.

MR. PRESIDENT: The reorganization of the Army required by the act of July 15, 1870, the provisions of which were alluded to in my last annual report, has been accomplished. The enforcement of that portion relating to a reduction of commissioned officers demanded strict investigation of the records of the military conduct and service of supernumerary officers, and forced upon the Department an unpleasant duty. It is believed, however, that the decisions finally reached were fair, impartial and for the good of the service. In accordance with the same act the number of enlisted men was on July 1 reduced to 30,000; indifferent soldiers were discharged, the standard of recruits was raised with a view to improving the character of the rank and file, and the following table of organization was established:

Enlisted men of engineers.....	301
Enlisted men of ordnance	475
Ordnance sergeants at posts.....	200
Military Academy band.....	24
60 enlisted men per company for 55 companies artillery.....	3,300
84 enlisted men per battery for 5 batteries light artillery.....	420
84 enlisted men per company for 120 companies cavalry.....	10,030
60 enlisted men per company for 250 companies infantry.....	15,000
Non-commissioned staff of regiments.....	200
	30,000

The staff of general officers was also reduced to the simple requirements of the Army in time of peace, and the line officers thus relieved from detached duty were ordered to their regiments where they could be of more benefit to the service.

The total expenditures for the fiscal year ending June 30, 1869, were \$80,644,042 76; the expenditures for the year ending June 30, 1870, were \$57,655,675 40, which sum includes \$3,697,500 for river and harbor improvements. The expenditures for the year ending June 30, 1871, were about \$40,000,000, including for river and harbor improvements \$3,945,900. Thus during the year 1869-'70 the reduction in expenses of the War Department amounted to \$22,988,367 36, and during the year 1870-'71 a further reduction of \$17,655,675 40 was made. For the next fiscal year 1871-'72 there is appropriated \$36,530,776, including for river and harbor improvements \$4,407,500.

The total estimate for military appropriations for the fiscal year ending June 30, 1873, is \$32,415,472 85. Of this estimate the sum of \$1,153,607 05 is necessitated by the prohibition of the use of unexpended balances of former years, thus requiring estimates for reappropriation of such sums as have reverted to the Treasury under the fifth section of the act of July 12, 1870. The estimate of the Chief of Engineers for fortifications, improvement of rivers and harbors, public buildings and grounds and Washington Aqueduct, are submitted separately, as presented by that officer, as follows: Fortifications and other works of defense \$3,255,500; for river and harbor improvements \$9,930,200; and for public buildings and grounds and Washington Aqueduct \$446,704.

Up to this date, during the current fiscal year, there has been paid into the Treasury, as realized from the sale of arms and from other sources, during the current fiscal year, \$21,766,403 07.

Under the act of July 27, 1861, providing for the adjustment and payment of the claims of the several States for enrolling, subsisting, and other expenses incurred by them for troops called into the service of the United States, these claims were paid out of any money in the Treasury not otherwise appropriated. The act of July 12, 1870, repeals the appropriation clause of the act of July 27, 1861, and requires the proper Department to submit estimates for these expenses, in the usual manner. I have accordingly submitted an estimate of \$3,000,000 for this purpose, that being the amount designated by the Third Auditor of the Treasury as being required for the settlement of claims now pending in his office for the next fiscal year.

The reports of the General of the Army and of the division and department commanders, herewith submitted, will convince the country that the officers and men of the Army have performed the duties devolving upon them faithfully and well. Though these duties, resulting from the determination of the Government to enforce the laws for the collection of the revenue and for the suppression of armed insurrection, have few agreeable features, they are performed with that cheerful energy which is the result of discipline. The records of the Department show that one hundred applications for troops for various purposes, and for military protection, have been made since January 1, 1871, all of which, where the necessity required it, have been promptly responded to.

It is with great embarrassment and difficulty that the appropriations made at the last session of Congress—reduced as they were below the estimates of the Department—can be so economized as to answer the pressing requirements of the service. The operations of active warfare in Arizona, in connection with Indian difficulties there, are such as necessarily require large expenditures, and the causes which have produced this necessity were not anticipated by Congress when the appropriations were made. The officers in charge of these operations—General

Schofield, commanding the Division of the Pacific, and Colonel Crook, in immediate command of the Department of Arizona—have united with this Department in endeavoring to retain the expenses at the lowest possible limit, and have used the most judicious efforts in this direction, and the conduct of Colonel Crook in his administration of the affairs of his department has received my full approval. While, therefore, the full appropriations asked should be given, continued endeavor will be made to prevent any expenditures beyond those absolutely essential.

I recommend that the *extra* lieutenants now authorized by law to serve as regimental adjutants and quartermasters in the artillery, cavalry, and infantry regiments, as provided by sections 2, 3, and 4 of the act of July 28, 1866, be discontinued as vacancies occur in those grades. This would effect an ultimate reduction of eighty lieutenants; would result in a yearly saving, if the reduction should be completed, of nearly \$160,000, and would be of no detriment to the service.

It is further recommended that the grade of quartermaster-sergeant for the companies of cavalry, infantry, and heavy artillery be abolished. The duties of this non-commissioned officer before the late war were usually discharged by the first sergeant, and the present strength of a company is such that a return to the old system in this respect can well be made.

With regard to the grades of enlisted men known as company artificer and company wagoner, the state of the service is now such as to justify the recommendation that they too be discontinued and their duties devolved upon a smaller number of private soldiers, detailed for extra-duty service and employed under direction of the Quartermaster Department. Should this recommendation be adopted, 1,165 enlisted men would be dispensed with, at a gross yearly saving of \$412,740. From this deduct the probable cost of extra-duty men, estimated at two-thirds the number of artificers and wagoners—\$72,240—and the net saving will be over \$340,000.

By the act of March 3, 1863, the first six regiments of cavalry are each allowed one veterinary surgeon at a compensation of \$75 per month. By the act of July 28, 1866, the four other cavalry regiments are provided with the same organization, with the additional allowance of one veterinary surgeon to each, at a compensation of \$100 per month; that is to say, two veterinary surgeons are allowed to each of the latter regiments, one at a salary of \$75 per month and the other at \$100. To remedy this defective organization, I recommend that two veterinary surgeons be authorized for each cavalry regiment, at a compensation of \$100 per month, and that the provisions of the acts above cited be repealed.

In the general regulations of the Army, of 1863, a plan is presented by which soldiers who are frugal enough to save their pay shall have a safe deposit for it. The outline is simply this: Not less than five dollars may be deposited at any one time with the paymaster, at pay-day

when a check-book will be given the soldier in which the amount of deposit will be entered. These deposits cannot be drawn till the discharge of the soldier. They are not subject to forfeiture by sentence of court-martial, but belong to the personal estate of the soldier, voluntarily confided by him to the trust of the United States, until he receives final payment on discharge. The benefits of this plan are various. It prevents the vicious practice of confiding money to commissioned officers for safe keeping, which injures discipline by the invariable disputes engendered, and it avoids the lumbering of the pay-rolls by constant entry of pay not drawn.

By the restriction contained in section 7, act of July 12, 1870, which was interpreted by the Treasury Department to apply to these deposits, it became necessary to issue an order for rescinding this regulation, and to cause all the deposits to be drawn from the Treasury by soldiers holding check-books. The amount was considerable, and it is feared many men were induced to desert by thus coming into possession of unusually large sums during their term of service, instead of receiving them when discharged. It is recommended that provision be made to meet this unexpected application of the legislative restriction that the benefits of the regulation may be restored to the soldier.

The law authorizing the enlistment of men who are eighteen years of age, and by its language "the oath of enlistment taken by the recruit shall be conclusive as to his age." The appeals to the Department for the discharge of soldiers are almost numberless. The force of clerks employed upon this branch of office duty is not sufficient to answer the repeated applications for discharge, which fill the Department mails, and the stereotype refusal which must in most cases be given only stimulates the applicant to obtain renewed appeals from persons of influence and character, who willingly apply to the Department, with a request for assistance, without reflecting upon the embarrassment which is given, or upon the cost of a result so easily recommended and so difficult to justify. The enlistment of each recruit and the cost of transportation to his regiment involves an average expense of \$80 in each case. By his discharge this amount is a total loss to the Government.

The greater number of those for whom this costly favor is asked are under the age of 21 years, and in this connection I recommend that the law regarding enlistments be amended, and that no recruit be permitted to enter the service whose age, by his own oath, is not shown to be over 21 years—the oath, as now, to be taken as conclusive.

Experience shows that the age of enlistment for music boys can, with advantage, be reduced, and it is advised that the law be so amended that hereafter enlistments in that class of recruits may be made at the age of twelve years.

It was found impossible to prepare, in time for submission to Congress at its last session, a system of regulations for the administration of the affairs of the Army, as contemplated by the act of July 15, 1870. A

board of competent and experienced officers has been for some months diligently engaged in the compilation of a code of regulations, and the work is rapidly approaching completion.

Desertions during the past few months have largely increased. The reports received at the Department indicate that the reduction of the pay of soldiers from sixteen to thirteen dollars per month has contributed greatly to this result, as far as those men are concerned who enlisted prior to July 1, 1871, the date of reduction.

The board of officers directed to investigate the subject of military prisons and prison discipline in the British army, visited, last summer, the only military prison now in Canada, viz, the one at Quebec, and through the courtesy of the Inspector, Colonel H. F. Williams, were enabled to witness its practical workings. The board were very favorably impressed with the good results obtained from this system, which has now been fifteen years in operation in the British service, and recommend its adoption in our own. I invite the attention of Congress to this subject, believing it to be of great importance to the efficiency of our Army, which is greatly impaired by the inadequate and imperfect means of punishment now practiced. By having the pay of the convicts forfeited to the prisons, but little, if any, additional means would be required to support them after they were put in operation. The report of the board is full of interest and will hereafter be transmitted to Congress.

The retired list of the Army is now limited to 300. The endeavor has been to equalize the selections for that list from both the higher and lower grades of the officers entitled to be placed upon it, so that it may not be filled to an unreasonable extent by officers of high rank and consequently greater compensation. There have been sixteen deaths of retired officers during the past year.

By the act approved September 28, 1850, appropriation was made of \$10,000 for purchasing, walling, and ditching a piece of land near the city of Mexico, for a cemetery for such of the officers and soldiers of our Army as fell in battle or died in and around that city during the Mexican war, and for the interment of American citizens who have died there.

In December, 1869, a report was made by the vice-consul of the United States at the city of Mexico, to the effect that, in consequence of neglect and the want of means for repairs, many depredations were being committed, and that the cemetery presented a lamentable appearance of dilapidation. An appeal was made to this Department for funds to the amount of about \$1,150 to be sent to the consul to enable him to restore the cemetery to a condition creditable to the United States Government. The War Department was fortunately able to meet the temporary demand, but could not comply with a further suggestion for the employment of a superintendent at a salary of \$50 per month instead of \$20, the rate heretofore paid and which is deemed insufficient. By the act of July 21, 1852,

there was appropriated \$1,412 34, and by the act of August 31, 1852, \$3,000 for the purchase of the cemetery, under the direction of the President, and these sums were all disbursed by the Department of State. It is recommended that, as the general subject of national cemeteries is now administered by the War Department, a special act be passed placing this cemetery upon the same footing as other cemeteries, with a regularly appointed superintendent, and that a sufficient portion of the appropriations for national cemeteries be made applicable to the repair and preservation of the one in question. The latest report of the condition of the cemetery shows that, with the temporary aid afforded by this Department, its condition was very materially improved. An appropriation of \$1,200 is asked by the United States consul to complete the repairs and to construct an artesian well for irrigation, to preserve the shrubbery and save the annual tax for water.

By the tenth section of the act of July 15, 1870, the Secretary of War was required to investigate into what are known as the Montana Indian war claims of 1867, and to report to Congress the names of the persons entitled to relief, together with a statement of the facts and sums upon which such report may be based. The investigation was confided to an inspector general of the Army, whose report, setting forth the nature and amount of the claims and the amount required for an equitable settlement of them, was submitted to Congress at the last session and commended to favorable consideration.

To complete the investigation, there remained to be submitted a list of the persons entitled to relief and a statement of the award equitably due to each claimant. This list, when nearly finished, was, with most of the papers connected with the case, destroyed in the late fire at Chicago. A greater part of the original vouchers, however, had been returned to their owners after certified copies had been taken, and new copies can consequently be obtained. The claimants have been called upon by advertisement to furnish such copies, or, in default thereof, to file statements of their claims, and in this way the lost evidence will be measurably renewed. With these papers and such data as survived, a new report of awards can be made which will probably prove as reliable as the one destroyed. This report will be laid before Congress without material delay, its early preparation depending wholly upon the promptness with which claimants respond to the invitation to replace their evidence.

Under the joint resolution approved May 7, 1870, authorizing and empowering the Secretary of War to select and set apart for a permanent military post so much of the military reservation of Fort Snelling, not less than 1,000 acres, as the public interests might require for that purpose, and to quiet the title to said reservation, and to settle all claims in relation thereto, and for the use and occupation thereof upon principles of equity, I have selected and set apart for a permanent military post at Fort Snelling 1,521 $\frac{20}{100}$ acres, embracing the fort and buildings pertaining, and in full settlement and release of all claims in rela-

tion thereto, and for the use and occupation thereof, have conveyed to the purchasers of the property the remainder of the reservation, amounting to 6,394⁸⁰/₁₀₀ acres.

The proceeds of sales of clothing from June 30, 1870, to the present date amount to the sum of \$1,875,728 84, all of which, as collected, is turned into the Treasury and cannot be used by the Department. Some of the purchasers have not been able, on account of the disastrous effects of the Chicago fire to meet their engagements promptly, but the time of payment has been extended. A great amount of old clothing and equipage is unfit for Army use, and hence larger appropriations will become necessary. The cost of transportation for this year has been about \$1,500,000, which is but little less than for the previous year. The reduced Army is compelled to increased activity to compensate for its loss in numbers.

The appropriation for barracks and quarters has not been sufficient to shelter the Army in a manner essential to its comfort and health, and hence it is earnestly desired that the appropriation asked for that purpose may not be reduced.

Of the southern railroads which were allowed to purchase rolling stock and other railroad supplies from the United States, twenty-seven have paid in full, and twenty-four are still in debt to the Department in the sum of \$4,724,350 53.

In the office of the Quartermaster General large numbers of miscellaneous claims for transportation and for stores taken and used by the Army in certain States and Territories, under the act of July 4, 1864, have been filed and final action had as far as possible. These claims amount to many millions of dollars, and the large interests involved require that there should be more care taken of these important records than can be given them in the present building, in which a fire would be disastrous.

The number of graves in national cemeteries is 317,850, including 2,295 added during the year. The cemeteries cover an area, in the aggregate, of about 1,800 acres of land, acquired at a cost of \$170,000.

The attention of Congress is asked to the loss and embarrassment resulting from the condition of the title to sites of military posts in Texas. The law forbids the purchase by the Secretary of War of any lands without special authority from Congress. New posts on the remote and unsettled frontier of that State have generally been located on the public lands belonging to the State, as there are no public lands available owned by the United States in Texas. As soon as this Department begins to erect shelter for the troops, speculators enter these lands, and hence claims arise for rent and timber to an amount far beyond their value. An act authorizing the Department to quiet title to sites already occupied, and to purchase such as may hereafter be required, is necessary to remedy the evil.

The report of the Commissary General of Subsistence shows that the

Army has been well supplied during the past year. I agree with him that according to the varying necessities of troops stationed in the different climates of the country, there should be authorized for issue substitute articles, so that the food of the soldier may be at times varied from the regular ration. Since the last annual report a detailed statement has been furnished the Department of the Interior of the expenses incurred in the fiscal year of 1869-'70 by the Subsistence Department in furnishing supplies for Indians, which shows the amount to have been over \$1,600,000, of which \$1,200,000 has been repaid by transfer at the Treasury. It is desirable that appropriations for the subsistence of Indians, when necessary, be made for the disposition of the Interior Department, as the subsistence fund of this Department, based upon the appropriation actually necessary for the support of the Army, is not large enough to allow any portion to be diverted from its legitimate use without embarrassment to the service.

Owing to the deficiency existing in the clerical force of the Surgeon General's Office, a large number of official demands for information from the records of the office for the settlement of pension and other claims have remained unanswered. Under the act of Congress authorizing the appointment of hospital stewards, that force has been strengthened, and it is hoped that the accumulated work will be rapidly disposed of. There were 206 military posts requiring medical attendance on July 1, 1870. The number of medical officers is insufficient for the service, and I renew the recommendation that the law prohibiting promotions and appointments in that corps be repealed.

Part First of the Medical and Surgical History of the War is near completion, and will be laid before Congress during its coming session, when it is hoped sufficient appropriation will be made to continue the publication of the remaining parts. The report of the Medical Statistics of the Provost Marshal General's Bureau, the compilation of which was authorized by the act of July 28, 1866, is also nearly completed and is in process of being printed at the Government Printing Office. It is expected that the entire report will be printed and ready for distribution during the approaching session.

The Corps of Engineers during the past year has been actively engaged upon the works for the defense of our sea-coasts, on river and harbor improvements, and in surveys and reconnaissances and construction of light-houses. With the appropriations granted for fortifications in our principal harbors, these works along the Northern Atlantic and Pacific coasts have been pushed forward in their modifications as rapidly as the circumstances would permit, and already the batteries are beginning to assume the character needed by the requirements of modern warfare. The modifications referred to look to the strengthening of our works by the introduction of heavy earthen batteries for the largest guns and mortars.

Since the last report the battalion of engineers has been reduced to

354 enlisted men, and constitutes an efficient body of troops, and is carefully instructed and drilled in its duties. The engineer posts and depots of Jefferson Barracks and Yerba Buena Island have been broken up and the troops are now concentrated at Willet's Point and West Point, New York. Besides assisting in the instruction of the cadets of the Military Academy, the battalion of engineers constitutes the school for the trials with torpedoes for the defense of our harbors, and takes charge of the depots for the bridge-trains and equipage and engineer tools for the use of the Army in general. The appropriation asked for torpedoes and other purposes at the engineer depot at Willet's Point and recommended to Congress.

A visit made to Willet's Point in September last gave me an opportunity for inspecting closely the management of the post, and for observing the advantages offered the men in drill and discipline, and in the education necessary for that arm of the service. The result was very gratifying. The thorough mode of instruction and the perfected drill of the battalion deserve commendation.

Satisfactory progress has been made in the prosecution of works for the improvement of rivers and harbors, and of the surveys connected therewith. The annual report of the Chief of Engineers contains a detailed account of the progress and condition of these works, and of the results of the surveys ordered by Congress. This report also contains information concerning the public buildings and grounds and the Washington Aqueduct.

Proper measures have been taken to carry out the joint resolution of February 21, 1871, in relation to the establishment of water-gauges, and making daily observations of the rise and fall of the Lower Mississippi and its chief tributaries.

Under the act of April 4, 1871, for the appointment by the President, of a commission to examine and report on the Sutro tunnel, Lieutenant Colonels H. G. Wright and John G. Foster, of the Corps of Engineers, and Professor Wesley Newcomb, a mining engineer, were thus appointed, and Captain W. R. King, Corps of Engineers, was directed to act as secretary to the commission. The commission has completed the investigations at the tunnel and the mines of the Comstock lode, and is now preparing to report.

In the survey of the lakes, operations were carried on in Lakes Superior, Michigan, St. Clair, and Champlain, and the progress of the work in the field and office has been highly satisfactory. The geological survey along the central route of communication with the Pacific coast has been actively continued, and the publication of the results, already begun, is looked for with much interest.

During the fiscal year small-arms and ordnance stores to the amount of \$10,000,000 have been sold, and the entire proceeds, except a small sum retained to meet expense of preparing other stores for sale, have passed into the Treasury beyond the control of this Department. The

operations at the arsenals have been confined to the manufacture of supplies required by the troops, to the care of stores on hand, and to the manufacture of one or two experimental gun-carriages. It is hoped that Congress will grant the appropriations asked for to carry out the plans for the continuance of the work at the great arsenal of construction for the Mississippi Valley at Rock Island. Several kinds of experimental rifles and carbines, as recommended by the St. Louis board, have been manufactured at Springfield armory for comparative trial in the field. An inspection of that armory, not long since, satisfies me of the necessity for continuing the appropriations for its maintenance and support. The ability of its present administration especially commends this well-appointed armory to the attention of Congress.

Sufficient information will doubtless be derived from the use of the experimental arms in the field, to enable a board to recommend a breech-loading system for adoption. The armament of State troops should be like that of the national forces, who now use breech-loading small arms. The reserve of 10,000 arms of that kind now on hand is not half sufficient to supply the States upon quotas now due.

Attention is called to the recommendation of the Chief of Ordnance concerning the repeal of the act prohibiting promotions and appointments in the Ordnance Corps.

An increase of the annual appropriations under the law of 1808, providing for arming and equipping the militia is urgently required.

The small clerical force allowed the office of the Judge Advocate General of the Army is not sufficient to perform the great amount of labor required to copy, on the demand of persons who have been tried, the voluminous proceedings of the courts-martial in their cases. The duty is an imperative one under the law, but the force is inadequate to its accomplishment, as may easily be seen upon an inspection of the record of the vast amount of work performed in that office. I recommend the continuance of the appropriation by which special copyists could be employed for this purpose.

At Fort Whipple, Virginia, instruction has been given in the meteorological duties and studies required at the signal-stations for observations and reports of storms throughout the United States, and in military signaling and telegraphy to officers of the Army and Navy. During the year the observation and report of storms has been necessarily rather in the process of organization for future success than as completely organized. A duty without precedent has had to be originated in all its details of plans and discipline—the observation, reports, and mode of making public the necessary deductions and reports. The progress made has been fully as great as could have been anticipated, and has secured valuable results and gives promise of extended usefulness.

By a comprehensive telegraphic organization each of the signal-stations is in telegraphic communication with the Signal Office at Wash-

ington, and from each of them daily and nightly weather reports are received at the Department. These reports are studied, bulletined, and charted at the office of the Chief Signal Officer, and are furnished at the same time to most of the principal cities and ports of the country. The deductions from the study of the reports are instantly telegraphed to the press and bulletined as soon as practicable at the observing offices, in board of trade rooms, merchants' exchanges, and other prominent places, and during the past year there have issued in this manner from the Chief Signal Office and the observing stations fifty thousand charts.

In the month of October the display of cautionary signals, announcing the probable approach of storms, was commenced, for the first time in the United States, at twenty ports upon the lakes and Atlantic and Gulf coasts. These signals are arranged to be displayed at any hour of the day or night, upon the receipt of telegraphic orders from Washington.

While the service has been rapidly organized and pressed to these results, each step has been taken only when the public mind seemed to be educated and prepared for it, and the public necessity demanded it. The average time of the receipt by telegraph of the reports and observations made simultaneously from all the stations throughout the United States has been 45 minutes. The average time elapsing between the moment at which telegrams were sent to the office at Washington from the most distant stations, to that at which the deductions are made, published, and issued to the press, has been 90 minutes.

Of the deductions published from the office, 69 per cent. are, after a careful examination of the statistics, considered to have been fully verified. This percentage, increased by those regarded as partially verified, will make an aggregate of 90 per cent. of average verifications.

It has been the policy of the Department to diffuse, as widely as possible, for the use of co-operating institutions, and for scientific study everywhere, the meteorological information collected at its stations and upon its records. It is believed that the United States now possesses a service more extensive and better organized for these purposes than that of any other country.

The steadiness, regularity, and promptness with which the varied labors incident to a work co-extensive with the United States, and which requires in its details a vigilance reaching through both night and day, have been accomplished, illustrate the advantages gained by placing these duties under military direction. A rigor less than that of military discipline would fail to insure the accuracy and strict obedience to orders which have been necessary.

Under the second section of the act of July 24, 1866, to aid in the construction of telegraph lines, and to secure to the Government the use of the same for postal, military, and other purposes, the Postmaster General has fixed the rates at which telegraphic communications for the Government shall be sent. The plan and method of compensation have

worked well, and are found to be of much economy to the signal service.

The wisdom of Congress in affording facilities for its prosecution is daily exemplified. The labors of this branch of the Department, undertaken with some hesitation as to the result and received at first with doubt in many quarters, have gradually grown into popular favor, and by the really wonderful results accomplished in this new field have commanded the attention and approval of the country. The fact that the reports daily issued find in most cases full confirmation, impresses itself on the minds of the people, and men of all callings, especially those engaged in commerce and agriculture, evince the greatest interest in this important work. Full recognition of its value has been given by the press and by the scientific men of other countries as well as of our own, and the results attained so clearly indicate its importance that I can, without hesitation, rely upon Congress for an appropriation for the prosecution and extension of its duties to the full extent of the estimate submitted.

By law the control of the Military Academy at West Point is devolved upon the Secretary of War. For some years past its immediate management had been intrusted to an officer of the Inspector General's Department, who faithfully discharged his duties. Feeling, however, that, for his better information and that he might more efficiently perform the duties that this responsibility placed upon him, there should be a more direct communication between the Secretary of War and the Academy, the system was changed, and now all reports are made directly to this office.

The present strength of the Corps of Cadets at the Academy is 229. Several instances of improper interference by cadets with their fellows have occurred, but the offenders have been summarily dealt with, and strenuous exertions have been made by the Department to prevent the recurrence of such disorders, and to improve generally the tone of military discipline. Legislation on the subject of the expenses of the Board of Visitors is desirable, as under existing laws for the payment of the board and lodging of the members, doubts arise as to what is properly to be included under the head of board. A per diem allowance would remove this uncertainty, and it is recommended that such an allowance be made in the next appropriation.

By the fire at the cadet barracks last winter, many cadets who were engaged, under the direction of their officers, in extinguishing the flames, suffered the loss of clothing, books, &c., and an appropriation is recommended to compensate them for such losses. The sum necessary for this purpose will not exceed six thousand dollars, and should be confined to compensation for their clothing and books.

The intelligence of the great fire of October in Chicago reached the Department while the flames were in progress, and orders were at once telegraphed to officers in charge of Army depots to forward to that city sup-

plies for the homeless and destitute. The promptness with which the wishes of the Department were carried out, merits high commendation. In a few hours, clothing, blankets, tents, and provisions were on their way to the stricken city, and this immediate action relieved much distress. The records and property in the building occupied for headquarters of the Military Division of the Missouri were totally destroyed, but the greater portion of the most valuable can be duplicated from the War Department. Several companies of troops were ordered to the city by General Sheridan, under whose supervision they assisted in preserving order during the trying days which succeeded the conflagration. The official and personal conduct of General Sheridan, while intrusted, by common consent, with the management of affairs in the city, receives the emphatic approval of this Department.

Similar issues of supplies of various kinds were made to the governor of Wisconsin for the relief of the sufferers in that State, and relief was also afforded to those in Michigan. Without further application, Congress will, without doubt, record its sanction of this action.

A perfect system of financial disbursements is a subject which, from the beginning of the Government, has commanded the attention of all the Departments; and the discovery of the astounding frauds, which have startled the country by their magnitude, has recalled attention anew to the causes which have combined to permit these dishonest actions to go so long undetected. No system of regulations can be devised which will make embezzlement, under all circumstances, impossible. The rogue is always vigilant. Counter-vigilance alone can thwart his schemes. The regulations now governing disbursements appear to be ample for the prevention of fraud. The failure to enforce them makes the path to fraud an easy one. The daring deceptions lately practiced provoke an inquiry as to some mode for the prevention of their recurrence. Relaxed duty, failing vigilance, and excessive confidence suspend all checks on dishonesty, and render regulations a farce. A careful scrutiny, by frequent inspections of the accounts of disbursing officers and of their cash balances, followed up, without loss of time, by a comparison of the result of this searching inspection with the officer's balance at the place of deposit, is clearly the only safe resort. The objection that a sentinel is thereby placed at every disbursing officer's door is not entitled to consideration. Integrity does not object to test. It invites scrutiny. An honest public officer prefers that his discretion should be limited. He accepts responsibility when it comes, but he cheerfully submits to any examination of his public conduct, deeming it no reproach that he is subjected to the operation of an inflexible rule, which the dishonest acts of others have made a necessity. Men of large experience as disbursing officers have told me that they do not remember a single defalcation which might not have been prevented or speedily detected by the exercise of proper vigilance on the part of the

supervising officer. In this he does not transcend his duty. He only performs it.

Why the necessity of furnishing duplicate statements to different Departments if no comparison is made? When the shock of discovery comes, and a great fraud is made manifest, it is clear that there is neglect somewhere. Is it in the regulations and orders and circulars issued for the prevention of these very frauds? Not at all; but in the disregard of supervising officers of their provisions. The vigilance which these circulars prompt, would, if exercised, furnish a different result. Holding these views as to the necessity for frequent inspections, and recognizing their great advantages, I propose, in this Department, to test their efficacy in the most thorough manner. In assigning inspectors to districts, I shall deem it my duty to hold each one of them responsible for every misdemeanor which occurs in connection with the accounts of any disbursing officer in his district, which due diligence on his part would have prevented, so that he will feel that he has a trust with which he dare not trifle. A plan of inspection can, in my judgment, be established, which will be simple and direct, and I shall endeavor to show by its operation that it is eminently practicable. With detection made morally certain, and with punishment sure and speedy, there can be no safety for fraud.

The proclamation of the President of May 3, 1871, calling attention to the act of Congress entitled "An act to enforce the provisions of the fourteenth amendment to the Constitution of the United States, and for other purposes," approved April 20, 1871, necessitated orders for the enforcement of the same by this Department, and consequently it was directed—

That whenever occasion shall arise, the regular forces of the United States stationed in the vicinity of any locality where offenses described by the aforesaid act, approved April 20, 1871, may be committed, shall, in strict accordance with the provisions of said act, be employed by their commanding officers in assisting the authorized civil authorities of the United States in making arrests of persons accused under the said act; in preventing the rescue of persons arrested for such cause; in breaking up and dispersing bands of disguised marauders and of armed organizations against the peace and quiet or the lawful pursuits of the citizens in any State.

It has been absolutely necessary to retain about one-sixth of the Army in those States of the South, east of the Mississippi, which were engaged in the war of the rebellion. Numerous applications for troops to aid in the enforcement of the laws were received from United States marshals, officers of internal revenue, and State officials; urgent appeals for assistance crowded in from private citizens, and it soon became evident that the security of the people demanded the continued presence of the regular forces. It is a painful fact, which merits serious consideration, that in some portions of the South freedom of opinion is not tolerated, if that opinion is expressed in opposition to the doctrines which originated the late rebellion. Indisputable evidence establishes the fact, which is proven, too, by the experience of numerous sufferers, that an

armed rebellion of regular organization and great strength now exists in parts of those States. The frequent reports by Army officers of perfect reliability, made after mature observation and judgment, conclusively show that the ramifications of this organized body are extensive; that its system is arranged with great care and shrewdness; that its persecutions extend in the dark hours of the night, and in cowardly disguise, to persons of every age, sex, and condition who dare to exercise a freedom of conduct, action, or speech which disagrees with the political doctrines of these marauders. This body of conspirators, constituted for the purpose of crushing out many of the inherent liberties of the defenseless people of those States, defies the law and spurns the authority of the Government, and so long as it exists, so long will it be necessary to aid the civil authorities with the armed force of the nation in putting down this second rebellion and in bringing its leaders to speedy punishment.

The attention of Congress has been repeatedly called to the necessity of appropriations for the speedy erection of a substantial fire-proof building for the War Department, and I cannot close this report without again alluding to the subject. The rented buildings, scattered all over the city, are remote from the main office and ridiculously unsafe. Many tons of records, to which the public business requires daily reference, are stored in these buildings. Besides their historical interest, these papers are of immense value for the protection of the Government against fraud, comprising all the muster-rolls of the regular and volunteer Armies, reports of Army officers, hospital records, accounts of public property, and, in fact, the accumulated records of the Department for seventy years, and are scattered here and there in such buildings as can be secured by rent from private parties, and utterly unsuited to the purposes for which they must be used. Every consideration of public interest urges me to press this matter upon the attention of the people's representatives, in the hope that they will act before a conflagration sweeps from the possession of the nation those records whose value cannot be told in figures.

Reflection on the mode of clerical selection and appointment suggests the hope that a system may be devised by the civil service commission which may extend its beneficial effects to the various Departments of the Government. The experience of those who have watched with interest the workings of this Department teaches that time is lost, money wasted, and business demanding attention delayed by the constant changes which occur under present laws and customs. A judicious reform would soon exhibit the great advantage of an improved system.

WM. W. BELKNAP,
Secretary of War.

REPORT OF THE GENERAL OF THE ARMY.

REPORT OF THE GENERAL OF THE ARMY.

HEADQUARTERS UNITED STATES ARMY,
Washington, November 6, 1871.

GENERAL: Since my last annual report of November 10, 1870, but few changes have been made in the boundaries of the military departments and divisions, and but few changes have occurred in their commanders.

The Military Division of the East is commanded by Major General Meade, and his two Departments by Brigadier Generals McDowell and Cooke. Recently the State of North Carolina has been detached from this Division, and added to that of the South for obvious reasons.

The Military Division of the South during the past year has embraced the Departments of the South and of Texas. General Halleck commands the Division, and Brigadier General Terry the Department of the South, and Colonel J. J. Reynolds that of Texas. By recent orders, the Department of Texas will soon be transferred to the Division of the Missouri. The rapid progress of the railroads in Texas, and of those leading from Missouri towards Texas, changes the whole problem of supplies; and the use of troops on that frontier will be greatly facilitated by these railroads.

A new Department is created in the Southwest, to embrace Louisiana, Arkansas, and Mississippi, and to supervise the forts along the Gulf of Mexico, which Department will be commanded by Colonel W. H. Emory; headquarters at New Orleans.

The Military Division of the Missouri is still commanded by Lieutenant General Sheridan, and embraces substantially all the frontier between the Mississippi River and the Rocky Mountains. This is divided into three Departments, commanded respectively by Major General Hancock, Brigadier Generals Pope and Augur. By recent orders, the Department of the Platte will be temporarily merged into the Department of the Missouri, which will give to General Pope charge of the defense of the Union Pacific Railroad, with all its branches, and the Territories lying near their routes.

The Military Division of the Pacific, commanded by Major General Schofield, remains substantially unchanged. His Departments are commanded respectively by Brigadier General Canby, Brigadier General Ord, and Colonel Crooke, Colonel Stoneman having been relieved in command of the Department of Arizona during the year by the latter.

I inclose herewith formal annual reports from nearly all these officers, describing in detail the operations of the troops under their commands, and the progress of development made during the past year, all of which are perfectly satisfactory.

By reason of the great fire in Chicago on the 7th and 8th of October, which destroyed the archives of General Sheridan's office, I am not in

receipt of his annual report, nor of those of his department commanders, but I know from other official papers that the affairs committed to their charge have been fully attended to, and I hope to receive and submit their reports before the meeting of Congress.

A review of these annual reports will, I feel assured, satisfy the Secretary of War that in whatever sphere of labor our troops have been employed, whether in maintaining good faith with our neighbors on the north, or on the Mexican border; in repressing Indian incursions and outbreaks; in protecting the well-disposed inhabitants of the South, and on the sparsely settled frontiers of the West; in aiding the revenue officers in the discharge of their unpleasant duties, and in sustaining the United States marshals and courts everywhere, they have displayed a zeal and intelligence worthy their good fame established in the past. As General Halleck recommends, however, it is eminently to be desired that the sphere of action of the Army in these quasi-civil cases should be better defined by statute; but in the absence of such statute, we can only rely upon the intelligence and good sense of the officers specially engaged. Thus far few mistakes, if any, have been made, and the conduct of the troops has met the hearty approval of the courts, the civil officers, and even of the inhabitants against whom they have been compelled to act.

At the date of my last report the aggregate strength of the Army was:

2,488 commissioned officers; 34,870 enlisted men.

By the act of July 15, 1870, it was provided that the number of enlisted men should be reduced to a maximum of 30,000 by or before the 1st of July, 1871.

General Orders No. 23, of the War Department, dated March 16, 1871, prescribed the manner in which this reduction should be accomplished. According to the muster-rolls on file in the Adjutant General's Office, the aggregate number of enlisted men on the 30th day of June, 1871, was 29,250.

The Army is necessarily so scattered to remote and inaccessible points, and casualties are constantly happening by death, desertion, and by the expiration of terms of enlistment, that it is very difficult to ascertain the exact number of men at any one instant of time; but, according to a statement prepared on the 20th of October, 1871, from the latest returns, the Army was composed as follows:

Ten regiments of cavalry, 8,800 enlisted men; five regiments of artillery, 3,205 enlisted men; twenty-five regiments of infantry, 13,742 enlisted men; one battalion of engineers, 314 enlisted men; ordnance department, 444 enlisted men; West Point detachment, 202 enlisted men; signal detachment, 199 enlisted men; hospital stewards, 310 enlisted men; ordnance sergeants, 114 enlisted men; available recruits *en route*, 349 enlisted men; permanent recruiting parties, 904 enlisted men; general-service men at War Department and Department headquarters, 420 enlisted men; total enlisted men, 29,003; commissioned officers, 2,105; retired officers, 295.

It will thus be seen that the numbers of enlisted men and officers are within the limits prescribed by law.

In order to maintain the military establishment within the limits prescribed in the act of July 15, 1870, each company must be kept below its proportionate standard, and the consequence is that many of the companies at distant and inaccessible posts fall below a number fit for efficient military service, and it is simply an impossibility to guard against this result; and I do hope that Congress will remove the restriction, and give

the President the discretionary power to keep the companies up to a standard ranging between sixty and one hundred privates, according to the nature of the service required of the troops. Such a measure would add very much to the efficiency, and would rarely, if ever, carry the aggregate strength of the active Army above the standard of 30,000 men, now fixed by law.

I must again earnestly represent the great necessity that new regulations be provided for the government of the Army. I am aware that a competent board of officers is employed by your orders in the preparation of such a code, and only refer to it on account of its paramount importance, and because daily and hourly I am reminded that the old regulations, now in force, are begetting habits that will be hard to eradicate, and the sooner the old regulations are supplanted the easier will be the task of enforcing new ones. For a like reason, I also repeat my recommendation that some uniform system of tactics be adopted, embracing common principles for handling all the arms of service when brought under a common commander. The whole theory of army movements is based on the fact that one responsible head should control masses of men, and this cannot be done efficiently where one set of tactics is used for infantry, another for cavalry, and still another for artillery. I am convinced from experience that this is perfectly practicable and easy of execution, and care little whose particular system is adopted as a basis, because other changes will occur in the progress of time, and the beginning is all that is asked for, on some intelligent plan likely to result in ultimate good.

I also submit herewith a report from Colonel William F. Barry, 2d Artillery, giving an interesting account of the rise and progress of the Artillery School of Instruction at Fortress Monroe, which has been under his management since its foundation in 1867. By means of this school, without any special cost to the Government, the younger officers of artillery and a due proportion of non-commissioned officers are enabled to fit themselves for that special branch of the military service without in the least interrupting the garrison duty of their respective companies.

With great respect, I am your obedient servant,

W. T. SHERMAN,
General.

General W. W. BELKNAP,
Secretary of War.

NOVEMBER 7, 1871.

I now have the honor to submit the report of Lieutenant General Sheridan, with those of Major General Hancock and Brigadier Generals Pope and Angur, which complete the series of division and department reports for the past year.

W. T. SHERMAN,
General.

REPORT OF LIEUTENANT GENERAL SHERIDAN.

HEADQUARTERS MILITARY DIVISION OF THE MISSOURI,
Chicago, Illinois, November 4, 1871.

GENERAL: I have the honor to forward for the information of the General-in-Chief the annual reports of Major General W. S. Hancock, commanding Department of Dakota, Brigadier General John Pope,

commanding Department of the Missouri, and Brigadier General C. C. Augur, commanding Department of the Platte. It will be seen from these detailed reports that the general condition of affairs in this Division has been peaceful during the past year.

This condition has not, however, diminished the activity of our small force, which has been constantly engaged in protecting our exposed frontier settlements; the different lines of commercial travel and telegraph-lines, in furnishing escorts to surveying parties, for railroad and scientific purposes, and in guarding Indian agents on reservations, and aiding in the police and management of such reservations. We have also been called upon to support the officers of the civil law in the execution of their duties, especially in Utah.

In the performance of their varied duties, of which those above mentioned are the principal, the troops have been faithful and intelligent, and the services have been performed satisfactorily. For the zealous and economical administration of their respective military departments, the distinguished officers heretofore named are entitled to the highest credit.

I do not fully agree with General Pope in the proposed concentration of troops. I consider that the necessity for active operations against Indians in his command—except, perhaps, a small number of Apaches in the southwestern portion of New Mexico—to be at an end. His duties will therefore be simply to give protection to the general line of the frontier and commercial lines of travel, and to form here and there a nucleus for the youthful settlements constantly springing up.

As soon as active operations against Indians cease, our duties change from administering punishment to giving protection, and while, for the former purpose, I believe in the concentration of troops, for the latter, I believe in having them somewhat dispersed, so as to cover more ground.

I hope in the early spring to strengthen the garrisons at Fort Ellis, in Montana, and Fort Buford, at the mouth of the Yellowstone, with the view of giving better protection to the people of Montana, and to the line of the Northern Pacific Railroad.

The number of desertions in the Army since the reduction of pay and clothing has been very large. The loss from this source has been, I think, fully equivalent to the gain to the Government by the reduction. The present pay is not in proportion to the pay of the same class in civil life, and many of the men who enlist now do so only to cover their wants at the time, and desert as soon as they can better their condition. I recommend an attentive consideration of this subject, with a view of arriving, if possible, at a remedy for a great evil.

I am, general, very respectfully, your obedient servant,

P. H. SHERIDAN,

Lieutenant General United States Army, Commanding.

ADJUTANT GENERAL OF THE ARMY,

Washington, D. C.

REPORT OF MAJOR GENERAL HANCOCK.

HEADQUARTERS DEPARTMENT OF DAKOTA,

Saint Paul, Minn., October 23, 1871.

SIR: I have the honor to submit the following report of military operations in this department, since the date of my last annual report, (November 1, 1870.)

The department is, as at date of my last report, subdivided into the districts of "Minnesota," "Montana," and "Middle District," and the independent post of Fort Buford, commanded respectively by Colonels George Sykes, Twentieth Infantry, John Gibbon, Seventh Infantry, D. S. Stanley, Twenty-second Infantry, and Lieutenant Colonel C. C. Gilbert, Seventh Infantry.

The posts in the District of Minnesota are garrisoned by the Twentieth Infantry, distributed as follows:

Fort Snelling, regimental headquarters and one company.

Fort Ripley, one company.

Fort Abercrombie, one company.

Fort Wadsworth, two companies.

Fort Ransom, one company.

Fort Totten, two companies.

Fort Pembina, two companies.

Fort Ridgley, in charge of an ordnance sergeant. No garrison.

In the district of Montana, the troops, consisting of four companies Second Cavalry and seven companies Seventh Infantry, are distributed as follows:

Fort Shaw, regimental headquarters, and four companies of infantry.

Fort Ellis, four companies cavalry and one company infantry.

Fort Benton, one company infantry.

Camp Baker, one company infantry.

The Seventeenth and Twenty-second Regiments of Infantry garrison the posts included in the Middle District, and are distributed as follows:

Fort Sully, regimental headquarters, and four companies Twenty-second Infantry.

Fort Rice, regimental headquarters and four companies Seventeenth Infantry.

Fort Randall, four companies Twenty-second Infantry.

Fort Stevenson, two companies Seventeenth Infantry.

Whetstone agency, one company Twenty-second Infantry.

Lower Brulé agency, one company Twenty-second Infantry.

Cheyenne agency, two companies Seventeenth Infantry.

Grand River agency, two companies Seventeenth Infantry.

The independent post of Fort Buford is garrisoned by three companies of the Seventh Infantry.

The approximate strength of these several commands, taken from the last received official returns, is as follows:

District of Minnesota.

Post.	Officers.	Men.
Fort Snelling	6	87
Fort Ripley	3	53
Fort Abercrombie	4	52
Fort Wadsworth	6	117
Fort Ransom	3	65
Fort Totten	5	105
Fort Pembina	6	80
Fort Ridgley		1
Total	33	560

District of Montana.

Post.	Officers.	Men
Fort Shaw	15	171
Fort Ellis	16	275

Post.	Officers.	Men.
Fort Benton	3	45
Camp Baker	4	47
Total	38	538

Middle District.

Post.	Officers.	Men.
Fort Sully	15	238
Fort Rice	14	254
Fort Stevenson	7	125
Fort Randall	13	210
Whetstone agency	3	54
Lower Brulé agency	3	48
Cheyenne agency	6	108
Grand River agency	6	109
Total	67	1,146

Independent Post.

Post.	Officers.	Men.
Fort Buford	9	158

In addition to the above statement of the strength of the command, there are now en route, but not as yet officially returned as assigned to companies, recruits as follows: 104 for battalion of Second Cavalry, at Fort Ellis; 152 for Seventh Infantry; 100 for distribution to companies in Montana; 52 to companies stationed at Fort Buford.

One hundred for Twentieth Infantry; 75 for Twenty-second Infantry; making a grand total as follows:

Department of Dakota.

Post. •	Officers.	Men.
District of Minnesota	33	500
District of Montana	38	538
Middle District	67	1,146
Fort Buford	9	158
Recruits en route		420
Grand total	147	2,831

By comparison with my last annual report, it will be observed that during the year no new posts have been added to the department, and that two stations at Indian agencies, viz, "Old Ponca" and "Crow Creek," have been abandoned, the garrison of the former having been withdrawn to Fort Randall—that of the latter to Fort Sully, where it is believed their services are better utilized for the general interests of the military service.

The duties of the command have been, with few exceptions to be specifically mentioned hereinafter, of the passive character usual to times of peace on the frontier, viz, the construction and repairs of quarters and store-houses, guarding public property, and the protection of Indian officials and the various routes of travel within the limits of the department. For a sufficiently detailed account of the work accomplished in construction and repairs of buildings, reference is invited to the accompanying report of the chief quartermaster of the department, (marked A.)

It is believed that the fullest protection required has been given to all

agents and other officials of the Indian Bureau, and that all main lines of transportation and communication have been so guarded as to render them reasonably, if not entirely, safe for travel and transportation.

But one Indian depredation of serious importance is to be reported as occurring within this department during the year, the operations connected with which form one of the exceptions mentioned to the generally peaceful occupations of the command.

A party supposed to be Sioux, of Red Cloud's band, and about fifty in number, on the 24th July, 1871, entered from the east through one of the unoccupied passes of the "Little Belt" range of the Rocky Mountains, to the settlements in the valley of the Gallatin Fork of the Missouri River, and succeeded in stealing and making their escape with about one hundred and fifty head of horses taken from the settlers. As soon as news of the affair reached Fort Ellis, the nearest post, a cavalry command was promptly started on the trail and followed it as long as there was any prospect of overtaking the depredators.

The point where the trail was abandoned is about one hundred and seventy miles east of Fort Ellis, and about thirty miles west of old fort C. F. Smith. The direction of the trail, considered in connection with articles picked up on it by the cavalry, indicate very strongly that the party were from Red Cloud's band, whose home or principal range is understood to be in the vicinity of Fort Fetterman, Wyoming Territory, Department of the Platte. Since this raid, and to guard against others, scouting parties have been sent out at regular intervals from Fort Ellis and Camp Baker, to watch the country to the east of the Gallatin, and pursue any fresh trail leading to the westward. It is hoped this action will prove sufficient to prevent Indian raids on the Montana settlements in the future. At all events, it is, in my judgment, the best disposition that can be made for that purpose at present with the number of troops at my command in the Territory.

In connection with that great national enterprise—the construction of the Northern Pacific Railroad—the route of which for nearly four-fifths of its entire length lies within the boundaries of this department, I have to report that two important detachments are now in the practically unknown and unexplored region of country lying between the Missouri River and the Rocky Mountains, in the general direction of the course of the Yellowstone, for the protection of surveying parties of the road engaged upon a reconnaissance, to ascertain if a practicable route therefor is to be found from the junction of the Heart River with the Missouri, (near Fort Rice,) nearly due west to the Yellowstone, near the mouth of Powder River, and thence up the Yellowstone to a practicable pass in the "Little Belt" range of the Rocky Mountains. The first of these detachments consists of six companies of the Twenty-second Infantry, one company of the Twentieth Infantry, a detail of twenty men from the Twenty-second Infantry, acting as artillerymen, manning two Gatling guns, and thirty Indian scouts, composing a military force of about four hundred and fifty men, under the command of Major J. N. G. Whistler, Twenty-second Infantry. In addition, all the employes of the railroad company, and the quartermaster's employes connected with the train, are well armed and fully supplied with ammunition, making an aggregate force of about six hundred men. This party left Fort Rice on the 9th of September, rationed for sixty days, and carrying an ample supply of forage for the animals for the same length of time. When it left it was expected that the time provided for—sixty days—would enable the engineers to make all the requisite preliminary surveys from the point

of departure to the mouth of Powder River and return, and I see no present reason to doubt the fulfilment of that expectation.*

The carrying of forage for the animals was an act of necessary precaution, as the line of march lies through the heart of the well-known "bad lands," where but little grass is found, and that little will probably be burned by hostile Sioux of the Yellowstone region. Whether or not this will be the only act of hostility to be apprehended from the Indians referred to time alone will show, but it is known that they are bitterly hostile to the construction of the railroad through the Yellowstone country, and have announced their intention to prevent it. In any event, however, the party is strong enough, in my judgment, for its own protection and to accomplish the object of the expedition. It has not been heard from since its seventh camp, about seventy miles out from Fort Rice, at which time game was reported in abundance, and everything going on well. It is possible we may hear from it via Fort Buford, when it shall have arrived on the Yellowstone; otherwise, if everything goes well, we shall not, in all probability, receive any communication from it until its return to Fort Rice.

The other detachment referred to consists of two companies of cavalry under command of Captain Edward Ball, Second Cavalry. It left Fort Ellis, Montana Territory, on the 16th of September, 1871, and is escorting a party of the railroad company's engineers, whose work lies between the Belt Range of the Rocky Mountains, before referred to, and the mouth of the Powder River. It has not been heard from since its departure, nor do I expect any communication will be had with it before its return to Fort Ellis, especially if all goes well.

It may be stated that during the month of May, 1871, an escort was furnished to enable a surveying party of the Saint Paul and Pacific Railroad, a branch of the Northern Pacific, to run a "trial line" from a point near its present terminus on the Red River of the North, some twelve or fifteen miles south of Fort Abercrombie, to the Missouri River. A practicable line, not difficult of construction, was found, running near Fort Wadsworth, Dakota Territory, and striking the Missouri in the vicinity of Fort Sully. The extension of this railroad over or near this line will probably be accomplished at no distant day in the future, and taken in connection with the rapid progress of the main line of the Northern Pacific, will afford valuable assistance to the Government in the solution of the Indian problem, involved with the

* OCTOBER 26, 1871.

Since the above report was prepared, a telegram has been received at these headquarters from Colonel T. L. Crittenden, Seventeenth Infantry, commanding officer at Fort Rice, D. T., dated the 16th instant, stating that two officers from the Yellowstone expedition, which started from Fort Rice, had arrived at that post, having left the command forty-five miles back, on its return.

These officers reported the expedition as having been very successful. The country was found much better than had been anticipated; and the engineer in charge of the surveying party was reported as being delighted with the country for its railroad facilities, and deems the expedition to have been eminently successful in all respects.

No Indians were seen. Game was so plenty that the entire command fed upon it; very few of the command were sick and none had been lost. Eight or ten mules and horses worn out and a few broken down wagons abandoned, is reported as the whole extent of loss. The expedition struck the Yellowstone a short distance below the mouth of Powder River, the distance being two hundred and ninety miles, which was made in twenty-three days; the return trip occupying about sixteen days.

It is expected the troops belonging to posts on the Missouri River will return to their proper stations by steamboat; those belonging to posts in Dakota to return overland.

WINFD S. HANCOCK,

Major General U. S. A., Commanding.

settlement of the vast fertile region of country lying between Minnesota and the Rocky Mountains speedily to be expected and provided for. In this connection I deem it proper to advise you that, so far as I can judge now, it will become my duty to recommend the abandonment early next summer, or so soon as the line of the Northern Pacific Railroad westward to the Missouri is definitely fixed, of one or two of the least important posts now garrisoned in Eastern Dakota, and the removal of their garrisons to points on the line of the road to be hereafter selected or recommended for selection where they can be better utilized, not only for strictly military purposes, but also in connection with the construction of the road and in protecting settlers who will inevitably follow, if they do not precede, the progress of the work.

During the early spring and summer escorts were also furnished to the Northern Pacific, to enable several trial lines to be run between the Red River of the North and the Missouri; but as all those lines are understood to be abandoned in favor of one crossing the Red River at or near the mouth of the Cheyenne, and striking the Missouri near the mouth of Heart River, any more extended report of their operations is not believed to be required.

While referring to these great enterprises in progress within the limits of this department, it is deemed appropriate to mention the extension of telegraph lines which has been made during the year, and which may be expected to have a beneficial effect upon the interest of the military service.

One hundred miles of the line between Yankton, Dakota Territory, and Fort Sully, following the valley of the Missouri, authorized to be constructed under the direction of the honorable Secretary of War by act of Congress approved March 3, 1871, have been constructed, inspected, and received, opening telegraphic connection with Fort Randall. A recent letter from the builder informs me that another one hundred miles is ready for inspection. Within the ensuing year, without doubt, the whole line will be completed and in operation, giving a speedy means of communication with several important posts on the Lower Missouri.

The Northwestern Telegraph Company has just completed an extension of its line to Pembina, on the forty-ninth parallel, whence it is to be at once extended to the Hudson's Bay Company Post, Fort Garry. This line touches Fort Ripley, with which post we have been in communication some months. In a few days the line will be in operation to Fort Pembina, and in case of necessity, by means of a courier from that post, we shall be enabled to communicate with the important post of Fort Totten within twenty-four hours. These and all similar enterprises are of unquestionable military importance, as affording a speedier means of communication with, and concentration of, troops for military operations, enabling a smaller force to guard and protect a greater line of frontier.

It is my unpleasant duty to report a serious infraction of the neutrality laws of the United States as having occurred recently in this department.

At an early hour on the morning of the 5th instant an armed body of men attacked, captured, and, for a short time, occupied the post and trading-store of the Hudson's Bay Company situated one-fourth of one mile north of the international boundary-line as marked by the survey of Major Long, United States Army, in 1823, but one mile south of the international boundary-line as marked by the survey of Captain D. P. Heap, Corps of Engineers, in 1870. Immediately upon receiving infor-

mation of the attack, Captain Loyd Wheaton, Twentieth Infantry, commanding officer, Fort Pembina, with two companies of his regiment, composing the garrison of the post, proceeded to the scene of action. Arriving near, he deployed a line of skirmishers and advanced. As soon as the line was deployed a body of men, estimated as numbering from forty to eighty, was seen to leave the post and take to the woods adjacent. Captain Wheaton advanced his skirmishers as rapidly as possible to the boundary line as marked by Captain Heap, and captured the leader of the party, known as "General" O'Neil, also "General" Thomas Curley, of St. Louis, Missouri, and "Colonel" J. J. Donnelly, of Utica, New York.

Subsequently a Mr. Donohue, one of the leaders of the party, was captured by a half-breed and taken to the trading post, the agent or factor in charge of which turned him over to Captain Wheaton, who retained him in custody with the others mentioned.

Captain Wheaton captured 77 breech-loading (Bridensburg) rifle muskets, caliber .57; 17 muzzle-loading rifle muskets, caliber .57; 5 carbines, Smith's pattern, 1857; 11 sabres; 12,000 rifle-musket cartridges, caliber .57.

A quantity of goods which had been taken from the Hudson's Bay Company, and a wagon and horses that had been seized on the road, were recaptured and delivered to the owners.

O'Neil, Curley, and Donnelly were taken to Fort Pembina in military custody, and so retained until they could be brought before the United States commissioner at Pembina, Mr. Foster, by whom they and Donohue were discharged.

O'Neil and Curley have since been arrested by the United States marshal for Minnesota, and are now in custody in this city awaiting trial, before the proper United States court, for their offense against the laws of the country. I have every reason to believe their cases will receive a full and fair trial.

Captain Wheaton reports no need of re-enforcement to his garrison; that he is strong enough to meet any contingency likely to occur in his vicinity. Recruits are now *en route*, however, to fill up the two companies composing his command to the maximum standard. I apprehend no further disturbance on that frontier for the present nor in the immediate future.

Accompanying are the reports of the district commanders, to which reference is invited for any more detailed information which may be desired in regard to the situation and conduct of affairs in their respective commands.

Owing to the remoteness of the independent post of Fort Buford, the report of its commander has not yet reached me. When received it will be duly forwarded for file with and to accompany this report.

The annual reports to me of my principal department staff officers, of the administrative branches of the service, are also forwarded herewith for reference in matters of detail.

It is believed the reports of the chiefs of supply departments will show that while all regular supplies and allowances have been fully and promptly provided, the affairs of their respective departments have been judiciously and economically administered.

The chief paymaster reports the entire command fully and satisfactorily paid to cover the last muster.

The medical director reports the command in excellent health and a reduction of the sick-list since last annual report of near 25 per cent., attributable partly to the absence of epidemics, but probably more to the

increased air-space per man furnished by the additions to quarters, constructed during the year.

The report of the judge advocate shows a very decided and much to be regretted increase of the crime of desertion in the command during the year. This has been especially noticeable since the 30th June, at which time the increase of pay given by the act of Congress approved June 20, 1864, ceased, and is probably the effect in great part, if not wholly, of the expiration of the act in question.

I trust and believe the maximum of this effect has been reached, and that the number of desertions will rapidly decline in future.

Several times since assuming this command I have felt it incumbent upon me to ask for an increased force, especially cavalry, in this department. Believing those applications have not been disregarded, but have received the thoughtful consideration of my military superiors, and that it is their intention to strengthen the command as soon as practicable, having due regard to other pressing calls from our vast frontier, I do not renew the application, but refer to the subject in order that it may not be inferred from my silence that I have changed my views as to the importance and necessity of the increase called for.

I am, sir, very respectfully, your obedient servant,

WINFD. S. HANCOCK,

Major General, United States Army, Commanding.

ASSISTANT ADJUTANT GENERAL,

Headquarters Military Division of the Missouri, Chicago, Illinois.

REPORT OF BRIGADIER GENERAL AUGUR.

HEADQUARTERS DEPARTMENT OF THE PLATTE,

Omaha, Nebraska, October 2, 1871.

COLONEL: I have the honor to submit my report of the military operations within this department for the past year.

I am happy to be able to state that not a white man has been killed by Indians within this military department during the past year. It is believed this cannot be said of any other year since the country was settled. In two instances only has stock been driven off, and this was done by parties of "Minnecajous," who belong on the Yellowstone. This exceptional condition of Indian affairs on the frontier is a subject of unusual satisfaction. Under its happy effects the frontier settlements have strengthened and extended; new portions of the country have been explored, new mines discovered and worked, and an unprecedented increase of immigration has followed. In this State alone, I am informed by the president of the board of immigration, of Nebraska, that 40,000 have settled within its limits since the 1st of April last. Under this general quietude of the Indians, military operations have been limited entirely to precautionary measures. No expeditions against Indians have been necessary, except in pursuit of the two marauding parties above referred to.

In April, a camp, consisting of one infantry and one cavalry company, was established on the Loup Fork, about thirty miles north and west of Grand Island Station, for the protection of settlers in northwestern Nebraska, between the Platte and L'eau-qui-court. Another, with same organization of troops, was established on the Republican River, directly south of Fort Kearney, for protection of settlements in southwestern Nebraska, between the Platte River and the Kansas boundary. These camps were placed about sixty miles in advance of similar camps for

like purposes of last year, and settlers are even now in advance of these camps.

At Plumb Creek, O'Fallon's, and Medicine Bow Stations, on the Union Pacific Railroad, companies of cavalry have been, and are still, stationed for protection of railroad and neighboring interests. One company of cavalry has also been stationed at the Chug Water Station, between forts D. A. Russell and Laramie, for similar purposes. A squadron of the Fifth Cavalry has also been kept at Fort Laramie.

Two escorts, under officers, have been furnished to Mr. Clarence King's parties exploring and surveying along the forty-second parallel.

Escorts have also been supplied to surveying parties under the surveyors general both of Nebraska and Wyoming.

These companies and parties will be brought in to their proper posts when winter approaches, or earlier, if their services are no longer necessary. In April last, the general superintendent of the Union Pacific Railroad informed me, in a written communication, that the coal miners at Carbon Station were on a "strike;" that they not only refused to work themselves, but would not permit a few others desiring to work to do so; and that they were exceedingly riotous, and threatened to destroy the railroad and its property in that vicinity. I also received information from the sheriff of the county that he was unable to serve or enforce a writ against these people. I directed the commanding officer of Fort Fred. Steele to send a company of infantry to go into camp at this point, with orders to limit their operations to protecting property there, preventing any interference on the part of the rioters with the running of the railroad, and to preserve the peace generally. On the arrival of the company, the commanding officer found that five men were shut up in the mines by the rioters, to perish, and that they had been there two days without food or water. He determined to relieve these men, though the rioters declared their determination to prevent it. But the company marched to the mines and relieved the men without being attacked, and, in a few days after, the rioters left the place and have not returned.

Recently, at Evanston, similar trouble was apprehended from riotous miners. A company was ordered there, but it was not necessary to actually send it, as the rioters became quiet when they learned that troops were to be sent.

In Utah the civil authorities have called for troops on two or three occasions to prevent anticipated violations of law and order. But in no instance has there been a necessity for troops to exercise force to accomplish the object sought. In every instance, where they had been called upon to aid in preservation of peace, their mere presence has been sufficient to secure it.

Captain William A. Jones, Corps of Engineers, on duty at my headquarters, was instructed by me in June to make an examination of the Uintah range of mountains, south and east of Fort Bridger, with a view of learning the character and extent of valleys of the streams heading therein, and their adaptation for cultivation or grazing; the character of the timber, its amount and location, and the feasibility of getting it to the railroad; to find, if possible, a practicable road from Fort Bridger to the Uintah Indian agency, and to examine the country on Green River with reference to the large mineral deposits reported there, and, as far as possible, give their character and extent, and generally, to gain all useful information concerning that comparatively unexplored country. Captain Jones has returned, but is now absent on other duty. His report, with a map of his route is not yet ready. They will be forwarded as soon as completed.

About the same time I sent a company of cavalry from Fort Fred.

Steele, with a party of officers and others to examine the Seminole range of mountains, north of that post, and between it and the Sweetwater. Their reports of finding large deposits of gold and silver have attracted to these mountains quite a large mining population, who are now successfully working a number of leads. A copy of the report of Lieutenant Colonel H. A. Morrow, 13th Infantry, who visited these mines, is herewith enclosed.

Under authority of the War Department, Forts Kearney and Sedgwick have been abandoned as military posts, being no longer necessary. The troops, stores, and all the material of any value, belonging to Fort Sedgwick, were transferred to Sidney Barracks. Nothing was left at the old fort but the walls of the adobe buildings. The stores and material at Fort Kearney, not required by troops in the camp south of it, have been transferred to Fort McPherson. The buildings at Fort Kearney are very old and of little value, and the lumber not worth moving. A vast amount of old iron has accumulated at this post, which may be of some value when the railroad south of the Platte is completed to that point.

Under authority of the War Department, the troops sent last year to Provo City, Utah, with a view of establishing a military post at that point, have been withdrawn to Camp Douglas, it being no longer deemed necessary to have a post there.

The agency of the Shoshonee Indians in the Wind River country, very properly, I think, was changed last spring from the Popoagie River to Little Wind River, a distance of about fifteen miles. This involved a change of location of Camp Brown, established for the protection of this agency, thereby very much increasing the expenses of the department, and the labor of the troops.

The only change in the troops of the department has been the transfer of the Fourth Infantry to the Department of the South. I inclose a report of casualties which have occurred within the department during the past year. The increased number of desertions is alleged to be due, principally, to the reduction of the soldiers' pay; to the change in system of settling their clothing accounts; and to their being no longer able to deposit their savings with paymasters beyond the fiscal year. These changes occurring at very nearly the same time may have been, and probably were, the cause of many desertions; but the great cause and occasion, directly and indirectly, of seven-eighths of our desertions, is, in my opinion, our present system of paying troops at long intervals of two months. If some system could be devised by which they could be paid every Monday morning, I believe that desertions, and trials by courts-martial, and the number of prisoners in the guard-houses would be diminished by one-half, at least—probably more.

The great number of discharges by order occurred in carrying out orders for reducing the army.

The chiefs of the various staff departments at these headquarters have performed their varied and important duties in a manner entirely to my satisfaction, and to the interests of the Government.

A map of the department, showing all the scouts and expeditions therein during the year, is in process of completion. It will be forwarded as soon as possible.

I am, colonel, very respectfully, your obedient servant,

C. C. AUGUR,

Brigadier General Commanding.

Lieutenant Colonel JAMES B. FRY,

Assistant Adjutant General, U. S. A.,

Headquarters Military Division of the Missouri, Chicago, Illinois.

REPORT OF BRIGADIER GENERAL POPE.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Fort Leavenworth, Kansas, October 2, 1871.

COLONEL: I have the honor to submit for the information of the Lieutenant General commanding the division, my annual report of affairs in this department.

I am happy to be able to say, that with the exception of some few robberies of stock, &c., by reservation Indians in the western part of New Mexico, and the killing of four or five men by Apaches, in the southwestern corner of New Mexico, on the line of Arizona, and near Fort Stanton, there has not been a depredation or murder committed by Indians in this department for the past twelve months. A list of the hostile acts referred to is herewith transmitted. Most of the depredations were committed by reservation Indians not under the jurisdiction of the military authorities.

ARAPAHOS AND CHEYENNES.

The danger from these tribes may be considered substantially at an end. It is possible, indeed probable, that some trifling depredations may be committed by small parties of these Indians in the future, but they will gradually cease with time. If the agents of the Indian Bureau remain firm in the course they have pursued for the past six months, the Indian question, so far as relates to the Cheyennes and Arapahoes, may be considered settled. The military forces now stationed to overlook them and frustrate hostile movements, must be kept in position for a year or two to come.

KIOWAS AND COMANCHES.

Since the visit of the General of the Army to Texas and Fort Sill, and his prompt and decisive action toward Satanta, Satauk, and Big Tree, of the Kiowas, that tribe has been quiet. The mules taken from the train attacked and captured in June last, in Texas, have been returned by these Indians, with earnest promises of good behavior for the future. The Comanches have been quiet.

It is to be understood that what I say of these Indians refers to this department only. It is possible, and likely, that small parties of both Kiowas and Comanches have made some raids into Texas, but I have had no reports indicating it. The reservations of these Indians are so situated as to furnish them every facility for such depredations in Texas, upon the settlements of which State they have long been accustomed to raid, and it would be surprising if, with such conveniences and temptations, they did not occasionally depredate in that region; but as with the Cheyennes and Arapahoes, I believe these hostile acts will become less and less frequent, provided always that the present system of treatment is adhered to faithfully, viz: that the troops be authorized to follow the raiders onto the reservations, seize the criminals, and turn them over to the civil authorities of Texas, and that the Indian Department withhold rations and supplies from the Indian tribe concerned until prisoners, stock, and other property captured in these raids, be returned to the Indian agent.

In this connection it is proper for me to say, that with a view to combined and systematic action of the military forces in that section of country, in controlling these Indians and arresting marauding parties.

into Texas, the posts of Sill, Richardson, and Griffin ought to be in the same department and under the control of a single authority. In this view I recommend that Fort Sill be transferred to the department of Texas, or Forts Richardson and Griffin be transferred to this department, preferably the former.

I say preferably the former for personal reasons only. It is likely that the progress of the railroad from Kansas to Texas, which has already passed Fort Gibson, and which makes the supply of, and communication with, these posts more direct, rapid, and convenient from this direction, will determine which of the two changes is the best for the public interests.

UTES.

I invite special attention to the condition of these Indians, and the precautionary measures which ought to be adopted in relation to them in the near future.

Colorado Territory is being settled so rapidly, and emigration is pushing so far into the unsettled regions and into the country yet belonging to these Indians, that contact with the Indians at remote places and at many different points is rapidly bringing about a condition of things extremely dangerous to the maintenance of peace. The time has fairly come when the safety and the welfare of both whites and Indians demand the establishment of the Utes upon limited reservations, and immediate measures ought to be inaugurated to this end.

Many of the Utes have been assigned to reservations, but they assert that they were deceived in the location of the reservations and otherwise unfairly dealt with. Whether such allegations are true is not so much the question—the feelings and opinions of the Indians on the subject must be considered, and means taken to satisfy them, as I believe could easily be done; otherwise we may anticipate constant trouble, an arrest of the settlement of Colorado Territory, and perhaps war with the Indians. All these things are to be deprecated, and, as I believe they can be avoided by timely and judicious action, I trust that the subject may be brought to the attention of the Interior Department or the President at an early day.

I do not doubt that a conference with these Indians by one or more of the peace commissioners would lead to good results, especially if Mr. Robert Campbell, of St. Louis, were one of them. His knowledge of Indians and of Indian character, and his discreet and careful management, are especially desirable.

NAVAJOES.

The Navajoes of New Mexico have in general remained upon their reservations and been quiet. Petty robberies and thefts have no doubt been committed by them, but according to my knowledge of the situation in times past, they have been as much sinned against as sinning. It is to be hoped that thieving may come to an end among them, and it is not unlikely that it will greatly decrease when the thieving raids upon them become less frequent.

It will be noticed in the list of depredations committed by Indians in New Mexico, that most the robberies of stock are charged to these Indians. I think these lawless acts will become less frequent as time goes on, and at all events they are neither extensive enough, nor attended with such danger, as to be very alarming.

APACHES.

Of the Apaches I can say little that was not said in my report of last year. They do not seem to have improved either in character or conduct. Nearly all their hostile acts have been done in Arizona, though a few will be noted in the accompanying list as having occurred near Fort Bayard in this department, near the line of Arizona.

I had proposed beginning some scouts against them this summer, but the arrival of Mr. Vincent Colyer, charged with the experiment of making peace with them, and placing them upon a reservation, made it proper for me to suspend any hostilities against them. He has designated a reservation for them on the Tuleroso, about ninety miles west of the Rio Grande, at Craig, and about sixty miles north of Fort Bayard. Those now on other reservations are to be moved to this new reservation at once, and I understand he does not despair of prevailing upon the whole tribe to settle there. I have, at his request, sent a company of infantry to take post on the reservation, and to protect the Indians and the whites against mutual depredations. I hope the experiment may be successful, and shall aid it by all the means at my command.

INDIAN RESERVATIONS.

In view of the continued process of establishing new reservations and what has happened at Camp Grant Reservation and elsewhere, I again invite attention to the views concerning the location of Indian reservations fully set forth in my report of last year. All experience of the past five years confirms, in my opinion, the bad policy of locating Indian reservations in the country occupied by the Indians concerned. I deem it unnecessary to add anything to what I have hitherto said on this subject, or to recite in detail the experiences which seem to confirm my remarks.

MILITARY POSTS.

I have abandoned the military posts of Arbuckle, Gibson, Smith, and Bascom, and removed the troops to posts on the plains. Although somewhat crowded, I think they will be comparatively comfortable this winter. I would be glad to be able to abandon many other posts in the department, which, from various causes, have become useless, but I have not the shelter for troops, and am therefore compelled to retain them.

The buildings at nearly all the frontier posts, now occupied by troops, are very cheap log or frame structures, put up hastily, and for temporary occupation. They need constant repair to keep them in habitable condition, and will need more every year. Every dollar spent on them I consider, in any view of the future, a waste of money. I do not doubt that the sums spent for repairs would, in the course of four or five years, amount to a sum sufficient to put up substantial new quarters at better points, and so as to concentrate the troops where they would be more efficient for the service required of them, and where they could be maintained at much less cost, and with great advantage to their discipline and morale. I do not think that any of the posts in this department, east of New Mexico, should have a garrison less than a regiment. The office now imperfectly performed by numerous small and expensive posts could be better, more cheaply, and more completely performed by moveable camps established in the neighborhood of the present small posts, during the summer season, the only time during

which Indian hostilities on the Plains may be expected, or are indeed practicable. I append what was said on this subject in my last report, more fully than it is necessary to repeat it here :

The completion of the Kansas Pacific Railway to Denver, and the changed condition of the Indians, both as to their location and relations with the military, have greatly simplified the question of the number and position of military posts, and have, I think, enabled us to determine, in most cases with some degree of certainty, the location of the permanent military posts in this department, and the military dispositions necessary for the future.

The railroad, traversing the department from east to west, furnishes cheap and rapid communication, and puts most of the posts within easy reach of supplies. It becomes practicable, therefore, to conduct military operations with facility over the larger part of this department—to receive immediate intelligence and to concentrate troops with rapidity. It seems, therefore, more practicable now to defend the numerous exposed points on the frontier from some large central posts, on or near the railroad, than it was, in times past, imperfectly to effect the same object by the establishment of numerous small posts. The Indians on the southern reservations cannot reach the settlements exposed to them in Kansas and Eastern Colorado without crossing, or very nearly approaching, the line of the railroad, where their appearance and number can be rapidly communicated by telegraph, and the necessary force sent by rail. Small detachments placed at the important stations along the railroad, in proper defensive buildings, easily protect such stations until assistance, telegraphed for, can reach them.

The depredations of Indians on the settlements in Kansas and Colorado must of necessity be committed during the warm weather. There is no grass for animals on the Plains in the winter, and the violent snow-storms and severe cold altogether prevent the Indians from traversing them at that season. Summer camps of cavalry or infantry, sent out in the early spring to important points from some large central posts, accomplish all the objects to be expected from small posts kept up all the year at the same points, and I am satisfied that they can accomplish these objects much more completely and at vastly less cost.

It may be safely asserted that the same number of troops stationed at a large post can be subsisted at a much less cost than would be incurred if they were distributed at a number of small posts. The administrative machinery of a small post—the police, the service in the quartermaster's and subsistence departments, and for daily extra duty—are nearly as great as for a large post. The waste of supplies, a large item, is greater when issued in small quantities than in large. It will be apparent, without detail, that the general statement as to expense is well founded.

The *esprit*, the discipline, and efficiency of troops are greatly promoted by assembling them in large bodies, equal, at least, to one regiment. Every officer knows this fact well.

In the service on the frontier, the want of men for active pursuit of Indians, and other military operations in the field, has been severely felt, and this want has been largely due to the distribution of the troops at small posts. With a thousand men at one post, it is easy to put into the field on the shortest notice eight hundred and fifty men. Distribute the thousand men to four small posts, and it will not be found practicable to put into the field six hundred men.

If, therefore, the needed protection to settlements and routes of travel can be as completely secured by a few large posts as by many small ones, three very important things can be accomplished: First, a large reduction of expense; second, better discipline and *morale* among the troops; third, the power to use much more of any given force for field service.

I propose, then, to examine the question as far as concerns this department.

And first, as to the country east of the Rocky Mountains, between the Platte and the Red River of Louisiana.

As I have before explained, the Indians who have heretofore roamed over this whole region, and from whom danger is to be apprehended, are those on the southern reservations in this department, viz: The Arapahoes and Cheyennes along the waters of the Canadian River, and the Kiowas and Comanches along the waters of the Red River, still further south. The whole region between the Arkansas and the Red Rivers, west of the Cherokee, Choctaw, and Chickasaw reservations, (where there is no likelihood of trouble,) is entirely unsettled, and, in the nature of things, must remain so until some railroad along the 35th parallel is built. This road, though projected, has not even been commenced, and its completion is so far in the future that it can be safely left out of the question now.

The depredations of these Indians in this department are committed upon the settlements in Kansas, of which there are none south of the Kansas Pacific Railroad, except east of the Great Bend of the Arkansas, (and these last settlements are now so populous and so far to the east that the danger of attack from Indians is very remote.) and

upon the settlements in eastern and southern Colorado and a small section of New Mexico, on the Canadian, east of Fort Union.

In order to reach any of the settlements in Kansas and Colorado, the Indians must pass over a great extent of uninhabited country, destitute of timber and scantily watered, and this they can only do from May 1st to about October 15th. Between the 15th of October and the 1st of May there is no grass to subsist animals in all that region, and for a large part of the time snow-storms and cold weather render it next to impossible to be traveled over. It is then only between May 1st and October 15th that the settlements in question require precautionary military arrangements against Indians.

Leaving out of the question, for the moment, Fort Sill and Camp Supply, which were established under peculiar circumstances and for particular objects, we have now for the protection of the settlements referred to, Forts Larned, Harker, Hays, Dodge, Wallace, Lyon, and Reynolds, beside the troops distributed at the important stations along the line of the railroad.

The garrisons of these posts amount in the aggregate to eighteen companies of infantry and seven companies of cavalry. Larned is fifty-five miles from the railroad; Dodge, ninety miles; Lyon, fifty-five miles; and Reynolds seventy-five miles. At all of these posts timber is wanting and wood is very expensive. The cost of hauling supplies to them in wagons from the railroad, either by contract or by Government trains, is very great. Yet not one of them is needed for at least six months of the year.

The Indians keep themselves closely to the wooded country south of the Canadian during the whole winter and until late in the spring, when the grass is sufficiently grown to subsist their animals. There seems no good reason why, merely for occasions which can only arise during six months of the year, we should keep expensive military posts *all* the year. It seems to me that we can very judiciously follow the example of the Indians themselves in this matter.

Without attempting to go more into detail in explanation of what seems very plain, the arrangements which I propose, in view of the circumstances thus set forth, are as follows:

For the region between the Platte and the Texas line east of the Rocky Mountains: To concentrate at Fort Hays the garrisons of Larned, Dodge, and Harker, or rather to establish at Hays the 3d or 5th infantry, with two companies of cavalry, for any contingency which may arise during the winter.

In like manner to concentrate, at a post to be established on the railroad at or near River Bend or Cedar Point, the garrisons of Wallace, Lyon, Reynolds, and a large part of the garrison of Camp Supply, which I presume will, under any circumstances now to be foreseen, be broken up next spring. In brief, to establish an infantry regiment and two cavalry companies at Hays, and the same force at Cedar Point. The material now in the buildings at Harker on one side, and Wallace on the other, is fit for use, and can be cheaply transported by rail from both posts to Hays.

Cedar Point is near (within fifteen miles) the promontory of pine timber which extends far to the east from the foot of Pike's Peak, and lumber could be had there at little cost. Coal has been found and is being mined at so many points along and near the railroad, that fuel need enter but little into the question of locating these posts.

I by no means propose to abandon altogether Larned, Dodge, Wallace, Lyon, and Reynolds, but to leave a small detachment, a picket, in fact, to hold possession of the buildings until they are no longer habitable. No repairs should be made and no expense incurred, however, at any of them. It is quite likely that the summer camps would be established in the immediate neighborhood of these posts, which could then be used to store temporary supplies and furnish shelter for sick men of the command camped near them. Before these posts would be entirely useless for such purposes, it is quite certain that the need of troops in the vicinity would no longer exist.

The large and valuable reservation at Harker, now surrounded by settlements, should be sold, and, if possible, the proceeds applied to building quarters for its garrison at Hays. It contains ten thousand two hundred and forty (10,240) acres, and is worth \$3 per acre.

From these two large posts, which shall take the place of the seven now occupied, it is proposed in the early spring to send out detachments of cavalry and infantry, in such force each as the post commander may think judicious, to encamp at important points in the vicinity of the present posts, or elsewhere, and to keep moving about in the neighborhood, always ready for service and always selecting camps where there is grazing for animals. Each commander of one of these two large posts should have a certain district of country to attend to, and having authority over all the detachments sent out from his post, he could strengthen, reduce, or concentrate the detachments as the special occasion might demand. During the six months thus spent in camp, no forage, except the grass of the prairies, would be needed; no wood, except what could be gathered by the command for mere cooking purposes; and there would be none of the constant daily expenses of a post occupied permanently by the same force. In the

winter these detachments, drawn in to the posts on the railroad could be supplied with everything needed at the lowest possible cost.

Of the economy of such an arrangement there can be no doubt, nor have I any doubt, for the good of the troops and for the protection of the country, it would be far more efficient than the present system of small posts. It is only during five or six months of the year that danger from Indians is to be apprehended. Of course, the larger the force we can use during that time, and the more freely it can move, the more efficient will be the service. The system of movable camps to take the place of the small posts perfectly fulfills the conditions.

From Fort Hays, thus enlarged, detachments could be sent (of cavalry) to the Saline, Solomon, and Lower Republican, as now; infantry and cavalry to the Big Bend of the Arkansas below Larned, to cover the settlements of Southwestern Kansas; infantry and cavalry to some point near Dodge; infantry and cavalry to some point near Wallace, or between that post and the Arkansas on one side and the Republican on the other. The commander of Hays to have the general command of all these detachments. The depot of supply for all to be at Hays. The commander of the post at River Bend to post cavalry and infantry at or near Lyon, at or near Reynolds, at or near the point where the Purgatory River leaves the Raton Pass, on or near the upper waters of the Republican, in two places, these last for precaution against marauding parties of Sionx and Cheyennes from the north side of the Platte. Thus this whole region would be occupied by forces constantly on the move, and in the most efficient condition, during the whole season of danger from Indians.

I have gone thus into detail concerning the part of this department treated of, so that my general purpose may be understood somewhat in detail. I shall merely indicate for the rest of the department the location of the posts I propose to retain, and their strength.

Fort Sill is an important position, and as a post for a regiment, or even eight companies of cavalry, it would be of incalculable use as a protection to the settlements in Texas, if only the post commander could be vested with power to overlook the Kiowas and Comanches, arrest any hostile expeditions into Texas before they left the reservation, or punish them when they returned from a raid upon the white settlements. With this power in his hands, if he should be a discreet and prudent officer, (and such an officer could easily be found,) the commander of Fort Sill could almost invariably arrest any hostile expeditions of Kiowas and Comanches without violence or bloodshed. In the hope that this power will be given him, I recommend, most decidedly, the retention of Fort Sill, and its enlargement so as to hold at least two more cavalry companies. It will be sufficiently near the line of the Pacific railroad—along the 32d parallel—for protection of the road and for all the conveniences the road will present.

NEW MEXICO AND SOUTHERN COLORADO.

The dispositions for protection to that part of Southern Colorado east of the mountains are to be made from the post at River Bend, as already stated. There is no present likelihood of hostility on the part of the Utes, and probably there will not be unless they are unjustly treated. As this may be confidently expected, however, with the progress of white settlements it would not be safe to proceed upon the assumption that no military precautions are needed against the Utes.

Fort Union, now the headquarters of the Eighth Cavalry, is admirably placed, not only to afford protection against the Utes, but to cover the whole of the eastern and southeastern frontier settlements of New Mexico against the Indians on the southern reservations. It is proposed to keep Fort Union as one of the large posts from which to send out detachments for the summer, on the plains east and south.

Fort Garland is also judiciously placed to cover the settlements along the Rio Grande north of Taos.

I do not believe that Fort Wingate is necessary. It is so far out as to require heavy expenditures for transportation of supplies, and does not seem to serve any good purpose. The Navajos are peaceable, and likely, I think, to remain so. Any evil acts they do are simple robberies of sheep or mules, and once in a long time the killing of a herder. As they can only depredate upon the settlements far in rear of Wingate, that post would answer every purpose if it were as far back as Laguna. Indeed, I doubt whether it is needed at all. A troop of cavalry at Laguna and one at Cebolletta, where forage is abundant and cheap, would answer every purpose.

Fort Craig I consider useless, and it should be given up. It is on private land, and is a growing and needless expense. Leaving a company of cavalry at or near Laguna and one at Cebolletta, it is probable that the present garrisons of Craig and Wingate could be quartered at Garland and Fort Union.

Such as could not be accommodated at those posts in the present buildings to be left at Albuquerque, where supplies of all kinds are cheap, and can be had on the ground.

In the southern part of the Territory of New Mexico there are now five posts, every one (except Fort Selden) established in a region distant from supplies and requiring

enormous expense of wagon transportation. They ought, in my opinion, to be reduced to not more than three, preferably two. Selden I consider important, and a post on the Mimbres to the west, to take the place of Bayard and Cummings.

Selden and the post west of it, on the Mimbres, would be quite near the 32d parallel, and certainly very near, if not directly on the proposed railroad along that parallel.

Fort Stanton is very remote from anywhere, and correspondingly expensive. It was established in 1855, with the idea that the country in the neighborhood would be settled immediately, and would soon render the maintenance of the post unnecessary. The military purpose was to cover the Jornada del Muerta and the line of settlements along the Rio Grande from the depredations of the Mescalero Apaches, who live in the Sacramento Mountains. Neither purpose was accomplished. It was too far away to protect the line of settlements along the Rio Grande, and certainly it would be safe to say that not more than twelve or fifteen hundred persons have settled in all the region near Fort Stanton for the fifteen years of its existence, and these settlers find their sole market at the fort. So far from being self-sustaining, the settlers could sell nothing except to the post, and if it goes they must go also, and that entirely irrespective of Indians. Whether it be the purpose of the Government to keep up a large post in so remote a place and at such enormous expense for such a purpose, I do not know; but speaking in a military view, Fort Stanton is wholly unnecessary. There were no settlers when the post was established, and the few now there must have gone at their own risk, and with full knowledge from all experience that the post was of necessity temporary. They exist now merely by trade with the post, and it seems rather absurd that a military post once established must be forever kept up for the protection of a few settlers who live by trading with it.

The removal of the garrison, however, (as indeed of any other,) will occasion loud outcry and endless petitions and representations. Once establish a post and it seems nearly impossible, without infinite clamor and objection, ever to remove it.

In brief, I propose in lieu of the ten posts in New Mexico to have four, or certainly not to exceed five posts. It will be necessary to build the post on the Mimbres west of Selden, and to enlarge Selden somewhat, and this I believe will be all that would be needed. Bascom has been abandoned and its garrison transferred to Fort Union.

Whilst, if left to carry out my own views on this subject, I would proceed at once to dispose the troops in this department as I have herein suggested, I do not advise, in view of all the circumstances remotely connected with the matter, any great or sudden change in the present arrangements. It will probably be more judicious to effect the changes gradually, as occasion offers, and to extend over several years the entire re-arrangement.

But I would decidedly advise that no more expenses be incurred at any of the posts herein proposed to be abandoned than are actually necessary, and none whatever for building, or even for repairs of any kind.

As fast as quarters become uninhabitable I would remove one company at a time to the large post designed to be its permanent station, and continue to do this gradually until all are thus removed. It is not unlikely that the repairs and heavy expense for transportation, for fuel and for forage, which will be needed at such posts for the next two years, remote as they are from the railroad, will require as much expenditure of money as would be needed to build quarters for the troops at the large post on the railroad. Whenever it becomes apparent that the repairs needed at the small distant posts approximate in cost to building quarters for them at the large post, the latter course should at once be adopted. In this manner, too, the post at River Bend and on the Mimbres in New Mexico can be gradually built. I should prefer to do the whole thing at once, and I think careful examination will show that it would be economy to do so. I am firmly convinced that the difference of expense between supplying the troops at large posts on the railroad and the same force scattered about at many small posts remote from the railroad, would in itself be sufficient in two years to build everything that is necessary to complete the arrangements I recommend.

I must leave a decision of the question to higher authority, merely re-affirming, with all the emphasis I can give it, the statement that, for economy, efficiency of administration and of military operations in the field, comfort, discipline, and morale of troops, there can be no question between the system of a few large central posts and that of numerous small posts.

I have no doubt that several of the posts in New Mexico could be abandoned to the advantage of the public interests, notably Forts Craig and McRae, but I have no other shelter for these garrisons. Experience has taught us pretty clearly what are the best points to be occupied in this department, and in what force, and I fully believe that both efficiency and economy would be secured by an immediate resort to the system of concentration.

Although we have on paper a regimental organization in the Army,

the Army in fact consists only of an aggregation of companies distributed at hundreds of small posts, and leaving no supervision nor control of his regiment to the regimental commander, who is himself only the commanding officer of a post, having nearly always a mixed garrison of two or three companies of his own regiment, and companies of one or more different regiments. It is impossible, with such *de facto* organizations, to have anything like regimental administration by the colonel, or to keep up that feeling in the regiment which goes so far to inspire desirable regimental pride, and to secure the *esprit* and competition for reputation so advantageous to the discipline, efficiency, and high tone of the Army.

FORT LEAVENWORTH.

I need add nothing to my report of last year concerning this post and depot. I believe that every interest of the service would be promoted by a very large increase here of accommodation for troops and public stores. This is the most valuable and well located for military purposes of any military possession which the Government now owns, and it is destined in the future to be the main station for the Army and the depot for the supply of the larger part of the military forces. Every year a considerable sum should be expended in enlarging it, and placing it in such condition as to fulfill its present and prospective object.

The whole subject is so fully understood by the War Department, the General of the Army, and the Lieutenant General commanding the division, that I need not press the subject further.

INDIAN RESERVATIONS AND WHITE INTRUDERS.

Of all the questions with which we have to deal in this department, this is the most difficult and vexatious, and I could wish that the War Department would issue some general orders defining carefully and in detail the duties of the Army in relation to it.

The rapid settlement of Kansas, the progress of the railroads through the Indian country west of Arkansas, and the Indian reservations in Kansas, the throng of laborers and employes of the roads, as well as of adventurous prospectors and squatters, and the fine agricultural country occupied by these reservation tribes, bring about relations between the whites and Indians at thousands of points, which involve troublesome and complicated questions, and constant difficulties which cannot be adjudicated or settled by the military authorities, and which are altogether beyond the management, or even the comprehension, of the average Indian agent. Every day these difficulties are increasing, and they are certain, in a comparatively short time, to be beyond control by the machinery, civil and military, used in times past. Doubtless wrongs will be committed upon these reservations by the whites along the line of railroad, both those in the employment of the railroad company and those who are there on their own affairs, and it is equally certain that the Indians will not be slow to do the same to the whites. The public sentiment of the people of Kansas is naturally in favor of the whites, however engaged in the Indian country, and any acts of the military forces in opposition to that sentiment are received with great disfavor. The officers and enlisted men are subjected to vexations and injurious proceedings in the courts, where juries have already pre-judged the case, and from whose verdict neither officer nor soldier, however correct in his action, can be protected. I do not intend to say that the courts would practice absolute injustice in this manner intention-

ally, but that the sentiment of judge and jury on this subject is such, and their theory of the right of occupation and settlement of the Indian country by white people so fully believed in, that no act of a military force in opposition, or such as would seem to frustrate the movement of white people into fine agricultural regions, now wasted on the Indian, would meet even with toleration by anybody. .

The boundaries of the reservations have in many cases never been accurately marked; some, I think, not at all, and it is often difficult to ascertain whether there has been intrusion upon them or not. The squatters, too, claim to have bought the head-rights of many of the Indians, and to have thereby become possessed of the same right to the land that any Indian has.

I only go thus into detail to show how many and how complicated these questions are. The progress of the railroads west and south through the Indian country is multiplying every day their number, and the embarrassments occasioned thereby, and already the situation has passed far beyond the legitimate province of the Army to deal with. The Indian agents I consider helpless and useless in the matter, except by the use of the military forces, and as Indian agents, as a rule, are not characterized by much wisdom or knowledge of law or good policy, I am not willing that the military forces should run the risk of violating the laws, or doing wrongful or violent acts merely because asked to do them by the agents. It does not seem to me judicious, in accordance with our form of Government, or reconcilable with any proper consideration for public sentiment, or for the accustomed means of executing the laws, that the military forces in this State be required, simply on the application of the Indian agent, who has no responsibility himself, and no power to protect those who execute his instructions against legal process, to arrest citizens of the United States, expel whole families by force from houses and lands which they occupy, or to destroy their property. These questions, as I have said, have now assumed large proportions, involve thousands of white citizens of the United States, and measures ought to be taken to provide for their adjudication by proper legal means; they certainly should no longer be left to the questionable and almost certainly uninformed judgment of Indian agents, sustained by military force.

I respectfully, therefore, repeat the request that careful and detailed instructions be sent me, defining as nearly as possible the duty of the military forces under my command in such cases. I have also to ask whether it is the wish of the Government to keep military posts in the Indian country west of Arkansas, merely as a police, under the orders of the Indian agent there.

I have ordered Fort Gibson, an expensive military post, not at all needed for the legitimate service assigned to the military forces in this department, to be broken up, and the garrison thrown out further on the Great Plains, where their services in protecting the country against the wild tribes are needed. The order had hardly been issued before the Indian agent of the Cherokees writes me that troops are needed to be kept at Gibson to protect the Cherokees against whisky-sellers, horse-thieves, &c., and wishes a cavalry force to be stationed at Gibson, and placed under his orders. The country occupied by these semi-civilized tribes (the Cherokees, Choctaws, and Chickasaws) needs some sort of organized civil government for dealing with precisely such questions. To leave them to be dealt with at so many different places, and involving so many people, both Indians and whites, by an Indian agent

of average intelligence, is absurd, or would be absurd, but for the very serious consequences involved.

SERVICES OF TROOPS.

The troops in this department have, in general, been actively employed in the field, only sufficient force being permanently left at the posts for their necessary service.

The result is seen in the extraordinary condition of quiet which has prevailed in the department for the past twelve months.

While all the forces serving in the department are entitled to every commendation, it seems proper that I should invite special attention to the marked services of the few whom station and circumstances have enabled to perform acts of special merit. The district of New Mexico has had three commanders within the past year. Colonel G. W. Getty was transferred to the Third Artillery, and left this department February 1, 1871, to assume command of his regiment. His long and valuable services, as commanding officer in New Mexico, are too well known to the authorities, and have too frequently been set forth in the department reports to need any further mention from me. Colonel J. I. Gregg, Eighth Cavalry, succeeded him in command of that district, and retained command until relieved by his senior officer, Colonel G. Granger, Fifteenth Infantry, May 1, 1871.

The administrations of both Colonel Gregg and Colonel Granger have been judicious and satisfactory, as the general peace and quiet of the Territory, in so far as Indian hostilities are concerned, will sufficiently testify. I do not hold either of them responsible for the small robberies and thefts committed by Navajoes and other reservation Indians, over whom the military have no jurisdiction.

Major Clendennin, Eighth Cavalry, with three companies of his regiment, has been in camp on the Canadian River, below Fort Union, during the entire summer, and has rendered important service in breaking up the illegal traffic with the Indians on the Plains, which has for years been carried on by Pueblo Indians and Mexican citizens of the Territory of New Mexico. This traffic, which supplied the wild Indians with arms and ammunition to depredate upon the trains and the settlements, has always been injurious and dangerous to the security of the very people among whom these infamous traders live.

Efficiently aided by his subordinates in command, Captain Raudlett and Lieutenant Caraher, Eighth Cavalry, Major Clendennin has captured many of these traders, some of their trains of supplies for the wild Indians, and large herds of cattle which they had bought from the Indians, but which had been stolen from farms in Texas. These prisoners and stock have been turned over to the civil authorities in New Mexico, under orders from Washington. I consider it altogether more judicious in the future to turn over such prisoners and stock to the civil authorities of Texas to be disposed of by them.

In the first place, the stock captured belongs to citizens of Texas, who cannot make the long journey through the Indian country to New Mexico to reclaim their property unless furnished with a strong escort of troops, nor could they return without such escort. And beside time lost, which can ill be spared by the frontier farmers of Texas, the expense of reclaiming their property in New Mexico, and getting it back to their homes, would almost equal the value of the property itself.

Second. The offense committed by these infamous New Mexican traders is against the citizens of Texas, in buying property which they

know has been stolen from the citizens of that State. It is certain that the knowledge that they would, if captured, be sent to Texas for trial, would be far more effective in deterring these traders from the further prosecution of their shameful occupation than any fear of trial by the civil courts in New Mexico.

In justice to the owners of the stock stolen, as well as in view of wholly arresting this illegal and dangerous traffic, I earnestly recommend that hereafter all parties arrested on the Plains east of the Pecos River in illicit trade with the Indians, and all stock in their possession stolen from Texas, be sent to that State under escort and turned over to the nearest commander of a military post in Texas, to be by him turned over to the civil officers of that State.

On the 5th of February of this year, Captain William Kelly, Eighth United States Cavalry, was dispatched from Fort Bayard, New Mexico, in pursuit of a party of Indians who had stolen a quantity of stock from Silver City. He found the trail on the morning thereafter, and followed it vigorously over a broken, wild country, until one o'clock on the 12th, when he overtook the party in the Chilicado Mountains, Arizona. A sharp fight ensued, in which fourteen Indians were killed and several wounded. The camp of the Indians was destroyed, and stolen stock recaptured. The gallant and meritorious conduct of Captain Kelly and his command was specially commended in orders from this department, and is respectfully brought to the attention of higher authorities.

I also deem it my duty to mention particularly the judicious manner in which Lieutenant Colonel J. W. Davidson, Tenth Cavalry, commanding Camp Supply, has managed his relations with the Indian tribes, (Cheyennes, Arapahoes, and Kiowas,) who range in the country around his post. To his care and watchfulness we are indebted for information which enabled us to forestall any hostile action of those tribes, and his judicious treatment of them went far to secure the quiet which has prevailed in that region.

Colonel Grierson, commanding Fort Sill, has managed his delicate and critical relations with the Kiowas and Comanches with good judgment, and it is hoped that, acting now in harmony with the agent of these Indians, and having resolved upon a fixed course with them, we may have no more serious Indian hostilities on the Texas border.

CONDITION OF THE TROOPS.

The discipline and condition of the troops in this department are generally good. The system of small posts, however, so widely scattered and in such remote places, is very prejudicial to any high state of discipline and *morale*.

Desertions have been numerous since the passage of the law reducing the pay of enlisted men; this reduction is no doubt one considerable cause of the desertions, but, in my opinion, there are other reasons quite as controlling to induce it. Troops stationed at eastern posts, in the midst of large communities and the neighborhood of large cities, are contented with the service, because in such places labor of all kinds is abundant and cheap, and laborers and mechanics are in excess of the demand. There is no opening in any civil pursuit for a soldier who deserts the Army, and he therefore remains content at his post.

In the West, especially on the frontier, every condition is different. The rapid settlement of the new States and Territories, the construction of numerous lines of railroad, the opening and working of rich mines and prospecting for others—in short, the wonderful enterprise and ac-

tivity everywhere prevailing, occasion such a demand for men, and open such avenues to prosperity and success, that the inducements to desert the service are almost irresistible to a soldier stationed in this region. A sober and industrious man, even without a trade, is welcomed everywhere, and every position is within his reach. I think one great cause of desertion from the army on the frontier is to be found in these facts: Most of our recruits are enlisted in the East and the eastern cities. They enlist because of the difficulty of getting work and supporting themselves; many, no doubt, to avoid actual suffering from want. If kept in the places where they enlisted, or, indeed, anywhere in the East where the like conditions obtain, they would no doubt remain in the service and be good soldiers; but brought out to this country, where want is unknown, and where every avenue to success is open to them, they are subjected to temptations difficult, and with many impossible, to resist.

It is not easy to suggest anything to remedy this condition of things, nor would the Government itself wish that the condition of facts and feeling in these respects surrounding the soldier should be changed. Whether more pay, and if so how much, would make the soldier serving on this frontier content with his lot, is very questionable, and the amount required not possible to determine, even if such a recourse were considered judicious. Deserters, unless utterly worthless, are welcomed to the task of aiding in the development of the enterprises so eagerly pushed forward, and it is very difficult to arrest such men unless, as I said, they are too worthless for any civil pursuit. In the end, perhaps, the Government loses nothing by bringing active, industrious men to this frontier country; but, on the whole, I believe it would be best for the military service if no more recruits were sent here from the cities east of the Mississippi. Although it would be much more difficult to keep up the strength of regiments, I am of the opinion that it would be better to allow a detail from each regiment serving on this frontier to enlist for the regiments in the States and Territories west of the Mississippi.

When a soldier who has deserted is arrested, he of course gives as a reason for desertion reduction of pay or harsh treatment. Of the first reason, I have said, perhaps, enough. There is little or no ground for the last. I firmly believe that harsh treatment of soldiers by officers or non-commissioned officers is at this time a very rare exception to the general rule, and that the error, if there be any, is in the opposite direction.

ADMINISTRATION.

It is not my province to enter upon any examination of the system of administration of military departments. The present regulations of the Army, which, for the time, have become law by the act of Congress, are well-known to be defective, and work badly in many essential particulars, among which, as leading to results prejudicial to efficiency, to economy of administration, and generally to the best interests of the service according to our experience in this department, may be mentioned: 1. The concentration of the minutest details of supply and expenditure in the supply bureaus in Washington. 2. The very inadequate protection of the Government against loss or damage of public property and stores afforded by the machinery of boards of survey.

By this concentration of details in chiefs of the staff departments, post commanders, as well as department commanders themselves, are to a very great degree divested of any responsibility for expenditures, either

of property or money, and having (through the absorption of all details by the supply Bureaus in Washington) neither credit to gain nor reputation to lose by the administration of his post, the post commander comes to think that everything that can be obtained for the post from the supply departments is so much clear gain. I do not mean to say that post commanders act upon this theory, but simply that the present system is well calculated to produce such an effect, and it is already the occasion of a looseness and irregularity in such matters difficult to check.

In relation to the second point mentioned, I think it will be generally admitted that boards of survey ought to be abolished, and their place supplied by some more effective machinery. According to orders and custom of service, post commanders are themselves responsible for all public stores or other public property at their respective posts.

Each post commander is allowed a post quartermaster and post commissary to assist him in the care and issue of the public property and stores furnished to his post, and each of these is in like manner made responsible for certain public property, the responsibility for the whole being, as before stated, vested in the post commander.

According to present regulations, when public property becomes damaged, (except by fair wear and tear,) or otherwise unsuitable for use, or a deficiency found in it, the officer accountable shall report the case to the commander of the post, who shall, if necessary, appoint a board of survey, whose duty shall be to examine the facts and fix responsibility for damage on the carrier, or the person accountable for the property, or having it in charge, &c. The officer accountable for damaged stores, therefore, (generally the post quartermaster or post commissary,) applies to his post commander, (who is equally responsible with himself for unnecessary damage to, or deficiency in, public stores,) for a board of survey.

The post commander, one of the principal parties accountable, selects a board of survey from the officers of his own post, whose comfort and convenience largely depend on their relations with their post commander. In the nature of things such a board would be very reluctant to fix responsibility upon the post commander, and the consequence is that in most cases the boards of survey are whitewashing concerns. Certainly everything in the manner of their organization tends directly to make them so.

If, however, they prove independent of such influence, and fix responsibility upon the post commander or his staff officer—the post quartermaster or commissary of subsistence—it is the right of the post commander to disapprove, and thus render void the whole proceeding.

In brief, the whole question of accountability for loss of, or damage to, public property, is to be determined by boards of survey, appointed by an officer who is himself accountable for it, and consisting of other officers whose personal situation depends so much upon their relation with the post commander, that they cannot be impartial actors.

In nine cases out of ten, proceedings of boards of survey are valueless, and afford no sort of protection to the public interests.

In view of justice to the United States and proper performance of duty by officers of the Army, all cases now committed to boards of survey should, in my opinion, be acted on by inspecting officers, either of the Inspector General's department of the Army, or officers specially appointed by the department commander for the purpose, who have no direct relations with the post or the officers concerned, and whose report would, of necessity, be divested of all the influences which bear upon the officers of boards of survey.

No officer, and no board of officers, belonging to a military post, ought

to be made judges in such cases as are now committed to boards of survey. It has been the practice in this department for the last year not to appoint a post commander, or an officer of his post, to condemn public property. Officers from other posts, if possible, senior in rank to the commander of the post concerned, have been selected for such purposes.

I believe every interest of the service in the case, and proper disposition of public property and stores furnished to the Army, would be promoted, and all officers more thoroughly and directly made to realize their responsibility for any neglect, carelessness, or inefficiency in the discharge of such duties, if boards of survey were abolished, and all the duties now devolved on them by regulations be given to officers of the inspector general's department, or officers specially detailed by department commanders for such service.

I think I may safely say that very large losses to the Government would have been prevented by adopting this suggestion, and I make it, therefore, in view of my own experience in this department.

There are many other defective and inefficient provisions in the old regulations not necessary to set forth here. It is hoped that the board of officers preparing new regulations for the Army, under the direction of the Secretary of War, may give the whole subject of administration careful consideration, and establish all military officials in their proper relation to such matters and to each other.

I deem it my duty, and one which I gladly perform, to bear testimony to the zealous and intelligent aid I have received from the officers of the general staff serving at department headquarters. I venture to express the wish that, unless the necessities of the service demand it, they be not changed.

I submit herewith the following papers:

1st. Report of Indian depredations in the department for the past year.

2d. Annual report of Colonel G. Granger, commanding district of New Mexico.

3d. Annual report of Colonel B. H. Grierson, commanding Fort Sill.

4th. Annual report of Colonel J. W. Davidson, commanding Camp Supply.

I submit these reports only because the district and posts concerned are in the Indian country, and the officers making the reports have had direct and constant relations with the Indians.

I also submit a roster of troops serving in the department, and their stations on the 1st of October, 1871. The changes made since that date are set forth in the accompanying orders, which were sent some weeks since to the division commander.

I am, colonel, respectfully, your obedient servant,

JNO. POPE,

Brevet Major General, Commanding Department.

Lt. Col. J. B. Fry,

Assistant Adjutant General,

Military Division of the Missouri, Chicago, Ill.

REPORT OF MAJOR GENERAL MEADE.

HEADQUARTERS, MILITARY DIVISION OF THE ATLANTIC,
Philadelphia, Pennsylvania, October 24, 1871.

SIR: I have the honor to submit, for the information of the General-in-Chief, the following resumé of the operations of the troops under my command during the past year:

At the date (October 27, 1870) of the last annual report, the division consisted, geographically, of the Departments of the East and of the Lakes. It comprised within its limits the following troops: three companies of engineers, one company of cavalry, thirty-six batteries of artillery, and thirteen companies of infantry.

No change has been made during the past year in the geographical limits of the departments composing the division, or in the number of posts occupied in each, with the exception of the occupation of David's Island, New York Harbor, by the Eighth Infantry, which regiment, by Special Orders No. 275, Headquarters of the Army, October 14, 1870, was transferred from the Department of the South to the Department of the East, eight companies reaching David's Island on October 28; the two remaining companies, previously stationed in North Carolina, having been ordered to rejoin the regiment, reached David's Island on the 30th October; also batteries K, First Artillery, and B, Fourth Artillery, joined the respective headquarters of their regiments early in May.

The troops have been employed, under the orders of the War Department, not only in the ordinary duties of the service, but in the special duties of aiding the civil authorities in preserving the peace at elections, in the collection of the internal revenue, and in the enforcement of the laws known as the Ku-Klux, in the State of North Carolina.

In this State the troops have, under the requisition of the civil authorities, Federal and State, been quite actively occupied, and the duties of their commanding officer, Major C. H. Morgan, Fourth Artillery, have been of a delicate and often embarrassing character, which it affords me great pleasure to state have always been discharged by Major Morgan and his subordinates with great credit to themselves and the military service.

The following chronological abstract will show the several orders and corresponding movement of troops during the year:

On November 1, 1870, the commanding officer, Fort McHenry, Maryland, was instructed by the War Department to hold the troops under his command in readiness (if called upon) to assist the United States marshal of Maryland in the performance of his duties during the week of election, to which five detachments of troops were furnished on requisition of the marshal.

On November 2, under instructions from the General of the Army, a force, under the command of Colonel I. Vogdes, First Artillery, consisting of 5 field, 5 staff, 50 line officers, and 1,070 enlisted men—total, 1,080, composed of engineer, artillery and infantry—was concentrated at the navy-yard, Brooklyn, to assist the Internal Revenue Department in the performance of their duties.

Under orders of the Secretary of War, of October 27, 1870, the following troops were concentrated at New York City on the 7th November, to protect and assist (if called upon) the civil authorities of the United States in enforcing the laws in connection with the election held thereat on the 8th November. The troops were stationed at different points in that city, where they remained until the morning of the 9th.

when they returned to their respective stations. Their services were not required, viz :

Available officers and 200 men of the Engineer Battalion ; seven batteries of the First Artillery ; six batteries of the Fifth Artillery ; and ten companies of the Eighth Infantry.

On November 4, the commanding officer, Fort Monroe, Virginia, was instructed to send two companies of artillery to Richmond, Virginia, to assist the United States marshal in carrying out the measures adopted to sustain the lawful United States civil authorities in the execution of their office. These companies were ordered back to their post on the 11th of that month.

On November 9, Battery E, Fourth Artillery, was withdrawn from Charleston, West Virginia, and rejoined its proper station, Fort McHenry, Maryland, November 11.

On November 21, Battery A, Fourth Artillery, left Graham, North Carolina, and took post at Lumberton, Robeson County, North Carolina, to aid the civil authorities in preserving the peace.

Under General Orders No. 125, from the War Department, of December 15, 1870, the principal depot of the cavalry service was transferred to Saint Louis arsenal, Missouri. Carlisle Barracks, Pennsylvania, was maintained as a sub-depot.

On January 9, 1871, under orders from the War Department, Battery I, Fourth Artillery, at Fort Foote, Maryland, proceeded to Fort Monroe, Virginia, to replace Battery F of that regiment. The latter battery left Fort Monroe on the 15th, and arrived the following day at Fort Foote.

On January 12, under instructions from the General of the Army, Colonel I. Vogdes, with a force of seven batteries of the First Artillery, three companies of infantry (forty men each) from Governor's Island, with available officers and men Eighth Infantry, concentrated at Brooklyn, Long Island, to aid the United States Internal Revenue Department in the execution of the laws. The force rendered good service, and returned to their posts on the following day.

On January 13, the headquarters First Infantry was transferred from Fort Porter, New York, to Fort Wayne, Michigan, arriving the following day.

On March 17, Battery M, First Artillery, left Fort Hamilton, New York Harbor, and arrived at Plattsburgh Barracks, New York, on the following day.

On May 5, Light Battery B, Fourth, joined headquarters Fourth Artillery at Fort McHenry, Maryland. On the following day Light Battery K, First Artillery, joined headquarters of regiment at Fort Hamilton, New York Harbor. These movements were made under General Orders No. 17, from headquarters of the Army, March 17, 1871.

On May 11, under orders from Adjutant General's Office, a detachment of one commissioned officer and forty enlisted men proceeded from Fort Johnson, North Carolina, to Laurensburgh, North Carolina, to aid the Internal Revenue Department. The detachment returned to their post on the 13th of the same month.

On May 22, Battery A, Fourth Artillery, changed station from Lumberton, arriving at Shelby, Cleveland County, North Carolina, on the 25th.

On May 27, Companies A and K, First Infantry, were moved from Fort Wayne to Fort Brady, Michigan, and Companies D and E of same regiment from Fort Brady (May 28) to Fort Wayne, arriving on the 30th.

On June 24, Battery A, Fourth Artillery, moved from Shelby, Cleveland County, to Rutherfordton, North Carolina, and arrived on the 27th.

On June 27, Company C, Seventh Cavalry, arrived at Rutherfordton, North Carolina, from the Department of the South.

On July 20, Carlisle Barracks, Pennsylvania, was discontinued as a sub-depot for the cavalry service, and the command thereat was transferred to Saint Louis Arsenal, Missouri, pursuant to General Orders 39, from the War Department, of April 20, 1871. Surgeon Joseph J. B. Wright, the ordnance sergeant, and ten enlisted men, general mounted service, remain in charge of the barracks.

On July 24, under instructions from the Adjutant General's Office, Batteries K, Second Artillery, and I, Fourth Artillery, proceeded from Fort Monroe, Virginia, to Raleigh, North Carolina, for temporary duty.

On July 31, two small detachments, each commanded by a commissioned officer, left Raleigh to aid the civil authorities in different sections of the State of North Carolina, and returned to Raleigh on August 8.

On August 1, Battery K, Second Artillery, left Raleigh for Hayward, Chatham County, North Carolina, to aid the civil authorities in quelling disturbances (should any occur) at an election to be held thereat. From Hayward a detachment, under charge of a commissioned officer, was sent to Jonesborough, to assist in similar duties, (if required,) and returned to Hayward August 8. The battery returned to Raleigh August 9. The election passed off peaceably.

On August 17, Battery K, Fourth Artillery, moved from Fort Macon to Raleigh, North Carolina, arriving same date.

On August 18, in compliance with orders from headquarters of the Army, Batteries K, Second Artillery, and I, Fourth Artillery, returned from Raleigh, North Carolina, to Fort Monroe, Virginia, arriving there the same date.

On August 21, Batteries C and D, Fourth Artillery, proceeded from Fort McHenry, Maryland, to Raleigh, North Carolina, arriving on 22d.

On August 23, Battery C, Fourth Artillery, was sent from Raleigh to Marion, North Carolina, to guard prisoners, &c.

On August 24, a detachment, under command of a commissioned officer, was sent from Raleigh to Moore County, North Carolina, to aid the United States marshal in endeavoring to effect the arrest of certain parties charged with murder; the detachment returned to its post on 26th August.

On August 24, Battery K, Fourth Artillery, was sent from Raleigh, and Battery G of same regiment from Fort Johnson, to Boure's Store, Robeson County, to aid the civil authorities in making arrests, and to assist the sheriff (if required) in the execution of his duties.

On September 4, Battery C, Fourth Artillery, changed station from Marion to Rutherfordton, North Carolina.

On September 21, Battery A, Fourth Artillery, was moved from Rutherfordton to Charlotte, North Carolina.

On October 11th, Batteries G and K, Fourth Artillery, were ordered back to their proper stations, the former to Fort Johnson, and latter to Fort Macon, North Carolina.

On October 17th, under orders of the President of the United States, a force, consisting of seven batteries of the First Artillery and Eighth Regiment of Infantry, (ten companies,) were concentrated at Brooklyn, Long Island, to aid the United States Internal Revenue Department in their duties.

At the present date, the number of garrisoned posts in the two departments constituting the division is 43, and the total strength present for duty, 4,413 officers and men.

I forward herewith the reports of the department commanders, also those of the chiefs of staff at these headquarters. These reports, especially that of the inspector general, indicate a creditable state of discipline among the troops and their officers. There are numerous suggestions contained in these reports, to which attention is invited, but I would call particular attention to the report of the board of officers sent by the commanding general, Department of the East, under the authority of the War Department, to inspect the military prisons of the Dominion of Canada, together with the indorsement letter of the commanding general, Department of the East.

The subject of a military prison, where enlisted men under sentence of a court-martial can be really punished, is one which has occupied my attention for several years, and on which I made a special report when commanding the Department of the East, in 1866. I would respectfully urge here, as I did when forwarding the report above alluded to, the recommendation that Bedloe's Island, New York Harbor, be selected as a reformatory military prison for the division.

I beg leave also to renew the recommendations made in former reports, that suitable and comfortable quarters for officers and enlisted men be constructed at all permanent fortifications where casemate quarters are now used.

Very respectfully, your obedient servant,

GEO. G. MEADE,
Major General, U. S. A.

ADJUTANT GENERAL OF THE ARMY,
Washington, D. C.

REPORT OF BRIGADIER GENERAL McDOWELL.

HEADQUARTERS DEPARTMENT OF THE EAST,
New York City, October 9, 1871.

COLONEL: In compliance with your instructions of the 11th ultimo, I have the honor to submit, for the information of the major general commanding the division, the following report of military operations in this department during the year ending September 30, 1871.

October 12. Battery H, First Artillery, left Fort Schuyler, New York Harbor, and took post at Fort Hamilton, New York Harbor, arriving there the same day. (See Special Orders 50, Military Division of the Atlantic, and Special Order 181, Department of the East, series of 1870.)

October 18. In order to allow the Engineer Department to remodel the work, Battery I, First Artillery, proceeded from Fort Delaware, Delaware, to Fort Wood, New York Harbor, where it arrived on the 20th. (See Special Orders 50, Military Division of the Atlantic, and Special Orders 198, Department of the East, series of 1870.)

October 24. In pursuance of instructions from the division commander, Battery A, Fourth Artillery, proceeded from Fort Monroe, Virginia, to Graham, Alamance County, North Carolina, arriving there the same date.

October 24. Pursuant to instructions from department headquarters, Battery H, Fourth Artillery, left Yanceyville, North Carolina, and took post at Raleigh, North Carolina.

October 28. The headquarters and eight companies (A, B, C, E, F, H, I, and K) of the Eighth Regiment of Infantry, under command of Colonel J. V. Bomford, arrived at New York City from the Department of the South, and immediately proceeded to and took post at David's Island,

New York Harbor. This in pursuance of Special Order 275, Adjutant General's Office, October 14, 1870.

October 29. In pursuance of instructions from the division commander, Companies D and G, Eighth Infantry, left Raleigh, North Carolina, for New York City, where they arrived on the 30th, and immediately proceeded to David's Island, New York Harbor.

November 1. I inspected the Eighth Regiment of Infantry at David's Island, New York Harbor.

November 2. In pursuance of instructions from the division commander, Major H. L. Abbott, Corps of Engineers, with two hundred engineer troops from Willett's Point; Major J. M. Brannan, First Artillery, with four companies of the First Artillery from Fort Hamilton, one from Fort Wadsworth, and two from Fort Wood, New York Harbor, and Colonel Bomford, with the Eighth Regiment of Infantry from David's Island, New York Harbor, the whole under command of Colonel Israel Vogdes, First Artillery, proceeded to Brooklyn, New York, to assist Supervisor S. B. Dutcher, of the Internal Revenue Department, in the execution of his duties. The troops, after a successful performance of the duties assigned them, returned to their respective stations on the evening of November 3.

November 7. In compliance with instructions from the honorable Secretary of War, a military force consisting of the available officers and two hundred men of the Engineer troops, from Willett's Point, New York Harbor, under Captain King, Engineer Corps; the Eighth Regiment of Infantry, from David's Island, New York Harbor, under Colonel Bomford; the batteries of the First Artillery, (B, C, D, E, H, I, and M,) stationed in New York Harbor, under Colonel Vogdes; Batteries A, B, and L, and Light Battery F, Fifth Artillery, from Fort Adams, Rhode Island, under Colonel Hunt; and Batteries H and I, Fifth Artillery, from Fort Trumbull, under Captain Guenther, came to New York City to protect and assist the civil officers of the United States in enforcing the laws in connection with the election to be held on November 8th. The troops were stationed under cover at various points in the city, where they remained under arms and ready for any emergency until about 5 a. m. on the morning of the 9th, when they returned to their respective stations. Their conduct was, without exception, exemplary.

November 9. In pursuance of instructions from Adjutant General's Office, Battery E, Fourth Artillery, returned from Charleston, West Virginia, where it had been on detached service, to Fort McHenry, Maryland, arriving there November 11.

November 21. At the request of the governor of North Carolina, and under authority from the division commander, Battery A, Fourth Artillery, left Graham, North Carolina, and took post at Lumberton, Robeson County, North Carolina, arriving there on the 22d.

November 26. On the application of the sheriff of the county, Captain Thomas, with a detachment of two non-commissioned officers and ten (10) men of Battery A, Fourth Artillery, left Lumberton, North Carolina, and "scouted the whole country for thirty miles," with a view to capturing the outlaw Lowrey and his band, returning to Lumberton the following day.

December 21. Pursuant to orders from department headquarters, two companies of the Eighth Regiment of Infantry, from David's Island, and a detachment of eighty-three men of the Engineer troops, from Willett's Point, came to New York City to act as escort on the occasion of the funeral of Rear-Admiral S. L. Breese, United States Navy, returning to their stations the same day.

January 8, 1871. In compliance with instructions from the headquarters of the Army, Battery I, Fourth Artillery, left Fort Foote, Maryland, and took post at Fort Mouroe, Virginia.

January 12. In compliance with instructions from the Adjutant General's Office, Major J. M. Brannan, with four companies of the First Artillery from Fort Hamilton, one from Fort Wadsworth, and two from Fort Wood; Captain Tyler, United States Army, with three companies of forty men each, from permanent party at Fort Columbus; and Colonel Bomford, with the Eighth Regiment of Infantry from David's Island, New York Harbor, the whole under command of Colonel I. Vogdes, First Artillery, proceeded to Brooklyn, New York, to assist Supervisor S. B. Dutcher, of the Internal Revenue Department, in the execution of his duties. The troops, after a successful performance of the duties assigned them, returned to their respective stations on the evening of January 13.

January 15. In compliance with instructions from the headquarters of the Army, Battery F, Fourth Artillery, left Fort Monroe, Virginia, and took post at Fort Foote, Maryland.

January 25. Major Charles H. Morgan, Fourth Artillery, relieved from duty at Fort Monroe by orders from the headquarters of the Army, and ordered to report to me for assignment, was placed in command of the post of Raleigh. I also placed the battery of artillery at Lumberton and the post of Fort Johnston under his orders.

March 17. In compliance with instructions from the division commander, Battery M, First Artillery, left Fort Hamilton, New York Harbor, and took post at Plattsburgh Barracks, arriving the following day.

May 4. First Lieutenant H. C. Cushing, Fourth Artillery, with a detachment of nine men of Battery H, Fourth Artillery, proceeded from Raleigh to Haywood, Chatham County, North Carolina, to aid the civil authorities in arresting certain persons charged with violation of the Ku-Klux law. The detachment, after arresting three persons, who were taken charge of by the deputy United States marshal, returned to Raleigh, North Carolina.

May 5. Light Battery B, Fourth Artillery, arrived at Fort McHenry, Maryland, from Fort Riley, Kansas, in the Department of the Missouri, and May 6th Light Battery K, First Artillery, arrived at Fort Hamilton, New York Harbor, from the same post. These batteries changed station in pursuance of General Orders No. 17, Headquarters of the Army, Adjutant General's Office, March 4, 1871, breaking up the school of instruction for light artillery at Fort Riley, and ordering the light batteries to the headquarters of their respective regiments, to be used as regimental schools of instructions in field artillery.

May 11. In compliance with instructions from the Adjutant General's Office, a detachment, consisting of one commissioned officer and forty men, proceeded from Fort Johnston, North Carolina, to Laurensburgh, North Carolina, to assist the supervisor of the Internal Revenue Department in the execution of his duties in connection with the Scotch Fair to be held at that place. The detachment returned to Fort Johnston May 13.

May 19. I inspected the Eighth Regiment of Infantry, and the post of David's Island, New York Harbor.

May 22. Battery A, Fourth Artillery, left Lumberton and took post at Shelby, Cleveland County, North Carolina.

June 17. Second Lieutenant F. V. Greene, Fourth Artillery, with a detachment of one sergeant and ten men of Battery A, Fourth Artillery, was sent with Deputy United States Marshal Bosher, from Shelby to

various points in North Carolina, (Cherry Mountains, &c.,) to assist in arresting certain persons indicted before the United States circuit court of the district of North Carolina. The detachment, after assisting in the arrest of about thirty persons, proceeded on the 21st of June to Rutherfordton, to which station Battery A had in the mean time been ordered.

June 23. Under authority from the division commander, I authorized Major Morgan, commanding at Raleigh, to move one or both of the batteries of artillery at Fort Macon, and the battery of artillery at Fort Johnston to such place or places in North Carolina as he might deem necessary, whenever, in his judgment, the public service required such action.

June 24. Pursuant to instructions from Major Morgan, Battery A, Fourth Artillery, left Shelby, North Carolina, and proceeded to Rutherfordton, Rutherford County, North Carolina, arriving there June 25.

June 27. In pursuance of orders from the commanding general Military Division of the South, based on a requisition of the commanding general Military Division of the Atlantic, Company C, Seventh Cavalry, arrived at Rutherfordton, North Carolina, from Chester, South Carolina, in the Department of the South.

June 30. Under authority from the Secretary of War, I ordered a board of officers, consisting of Colonel J. C. Davis, Twenty-third Infantry, Major J. M. Brannan, First Artillery, Major T. F. Barr, judge advocate United States Army, First Lieutenant A. B. Gardner, First Artillery, recorder, to proceed to Quebec and Montreal, Canada, to inspect and report upon the system of army prisons, army prison discipline, and military punishment, adopted by the British service, with a view to the introduction, if advantageous, of some of the features of that system into our service. The board was absent on this duty about three weeks.

The very interesting report of the board has already been forwarded to the War Department, and I trust their recommendations may find favor, to the end that something may be done to ameliorate the discreditable system, or want of one, which exists in the service in the punishment for military offenses.

July 13. First Lieutenant J. C. Calhoun, Seventh Cavalry, with twenty men, accompanied the deputy United States marshal to Cherry Mountain, to arrest certain parties of men who had been assembling there. The detachment, after assisting in the arrest of three men, returned to Rutherfordton.

July 20. In compliance with instructions from the War Department, Carlisle Barracks, Pennsylvania, was discontinued as a sub-depot for the mounted recruiting service, and the permanent troop and unassigned cavalry recruits proceeded, under command of Captain E. V. Sumner, First Cavalry, to St. Louis, Missouri. Surgeon J. J. B. Wright, United States Army, an ordnance sergeant, and ten men of the general mounted service as a guard, remain at the post under authority from the War Department.

July 24. In compliance with instructions from the Adjutant General's Office, Batteries K, Second Artillery, and I, Fourth Artillery, proceeded from Fort Monroe, Virginia, to Raleigh, North Carolina, and reported to Major Morgan, Fourth Artillery, for temporary duty.

July 27. I inspected the post of Plattsburgh Barracks, New York.

July 31. At the request of the governor of North Carolina, who feared that election disturbances might occur, Second Lieutenant John Simpson, Fourth Artillery, with a detachment of twelve men, was sent

from Raleigh into Robeson County. Lieutenant Simpson was also directed to assist the civil authorities, as far as possible, in capturing the outlaw Lowrey. The detachment returned to Raleigh August 8.

July 31. Second Lieutenant E. S. Curtis, Second Artillery, with a detachment of eleven men of Battery K, Second Artillery, accompanied Deputy United States Marshals Clark and Johnson, to Chatham, Randolph and Moore Counties, North Carolina, to assist in the capture of illicit distillers, serving writs, &c. The detachment returned to Raleigh August 8.

August 1. Battery K, Second Artillery, was sent from Raleigh, North Carolina, to Haywood, Chatham County, North Carolina, to assist the civil authorities in quelling disturbances (should any occur) at an election to be held at that place. On the arrival of the battery at Haywood, the battery commander sent First Lieutenant E. L. Huggins, Second Artillery, with a detachment of ten men, to Jonesborough, where an election was also to be held. This detachment returned to Haywood August 8, and the battery returned to Raleigh August 9. The elections passed off quite peaceably.

August 17. Major Morgan, having been requested to furnish guards for the prisoners ordered by Judge Bond from Rutherfordton to Raleigh, North Carolina, for safe-keeping, Battery K, Fourth Artillery, left Fort Macon for Raleigh, pursuant to his (Major Morgan's) order, arriving there the same date.

August 18. In compliance with instructions from the Adjutant General's Office, Battery K, Second Artillery, and I, Fourth Artillery, returned from Raleigh, North Carolina, to Fort Monroe, Virginia, arriving there the same date.

August 21. In compliance with instructions from the division commander, Batteries C and D, Fourth Artillery, proceeded from Fort McHenry, Maryland, to Raleigh, North Carolina, arriving there August 22.

August 21. I inspected the post of Fort Adams, Rhode Island.

August 23. At the request of Judge G. W. Brooks, of the United States district court, and United States Marshal Harrow, Battery C, Fourth Artillery, was sent from Raleigh, North Carolina, to Marion, McDowell County, North Carolina, to guard prisoners, &c.

August 24. First Lieutenant W. F. Stewart, Fourth Artillery, with a detachment of eight men, was sent into Moore County, to assist the deputy United States marshal in endeavoring to effect the arrest of certain parties charged with the murder of a colored man, named McLane. There were no arrests made, and the detachment returned to Raleigh August 26.

August 24. At the request of the governor of North Carolina, Battery K, Fourth Artillery, was sent from Raleigh, and Battery G, Fourth Artillery, from Fort Johnston to Boure's Store, Robeson County, to assist the civil authorities in capturing Lowrey and his band.

The commanding officer of these troops was also directed to assist the sheriff, if he should request him to do so, in effecting the arrest of certain parties against whom true bills of indictment had been found by the grand jury.

September 4. Battery C, Fourth Artillery, was transferred, by order of Major Morgan, from Marion to Rutherfordton, North Carolina.

September 5. I inspected Forts Warren and Independence, Boston Harbor, Massachusetts.

September 6. I inspected Fort Preble, Portland, Maine.

September 21. Pursuant to instructions from Major Morgan, of Sep-

tember 18, Battery A, Fourth Artillery, was transferred from Rutherfordton to Charlotte, North Carolina.

A report in detail of the operations of the troops in North Carolina, placed under Major Morgan's orders, will be found in that officer's report, herewith transmitted.

It will be seen, that the troops have done much in that section of the department, and in a way, the commander states, and no doubt justly, "as to have won the good opinion of all reasonable citizens by their uniform good conduct." I beg to commend Major C. H. Morgan, Fourth Artillery, to special notice, for sound judgment, efficiency, and ability with which he has discharged the delicate duties intrusted to him as commander in North Carolina.

In my inspections I have found the officers and men of the department in a good state of military instruction and discipline.

The reduction of the pay, and the change in the way of making up the clothing allowance, has operated unfavorably on the service. It is true, soldiers on enlisting agreed to accept such pay, bounty, and clothing as the Government might choose to give them, but they nevertheless felt a sense of injury on seeing their pay reduced at the time that of their officers was increased, and not having the option of leaving the service, many of them deserted.

I ask especial attention to the pay of the non-commissioned officers, as being too little above that of the private soldier; that of a corporal is in fact the same. If, as has been, and is hoped by some, the non-commissioned officer is to be promoted, the step from his present status to that of a commissioned officer is too great; and if he is not to be promoted, and is to be considered as having attained the end of his military career, his present pay and position is an insufficient recompense for a long period of faithful service.

I inclose herewith reports of the chiefs of the staff departments at these headquarters.

I have the honor to be, very respectfully, your most obedient servant,

IRVIN McDOWELL,

Brevet Major General, Commanding Department.

Colonel RICHARD C. DRUM, A. A. G.,

Headquarters Military Division of the Atlantic, Philadelphia, Pa.

REPORT OF BRIGADIER GENERAL COOKE.

HEADQUARTERS DEPARTMENT OF THE LAKES,

Detroit, Michigan, October 7, 1871.

SIR: I have the honor to submit the annual report of this military department. Since my last report, of October 17, 1870, only slight changes have been made in the disposition of the troops. In January last the headquarters of the First Infantry were transferred from Fort Porter, New York, to Fort Wayne, Detroit, Michigan. The garrison of Fort Brady, Sault Ste. Marie, was interchanged in May, with two companies from Fort Wayne.

The following is the present distribution of the troops of the department:

Fort Brady, Michigan, Companies A and K, First Infantry.

Fort Mackinac, Michigan, Company F, First Infantry.

Fort Gratiot, Michigan, Company H, First Infantry.

Fort Wayne, Michigan, headquarters First Infantry, and Companies D, E, and I, First Infantry.

Fort Porter, New York, Companies C and G, First Infantry.

Fort Niagara, New York, Battery L, First Artillery.

Fort Ontario, New York, Battery A, First Artillery.

Madison Barracks, New York, major, and Battery F, First Artillery, and Company B, First Infantry.

By War Department General Order No. 54, June 6, 1871, Detroit Arsenal was exempted from the supervision and command of the department commander, previously exercised under General Orders. The recruiting stations within the department limits are at Cincinnati, Dayton, Columbus, and Toledo, Ohio; Detroit, Michigan; Milwaukee and Oshkosh, Wisconsin. The reduction of the strength of companies to the new legal maximum was duly carried into execution June 30, two hundred and thirteen recruits being received about that time. The reduction was accomplished by sixty-eight discharges and four transfers.

The act of Congress approved March 2, 1871, providing for the conveyance to E. A. Franks, of the village of Mackinac, Michigan, of about sixteen acres of land of the military reservation, has been executed.

Work has been in progress under the act of Congress of July 11, 1870, by the city authorities of Buffalo, New York, to improve, in connection with a public park, the national property in the immediate vicinity of Fort Porter, adjoining that city. The acts of Congress, approved July 20, 1868, and March 18, 1870, for the sale and grant of portions of the military reservation of Fort Gratiot, adjoining the city of Port Huron, Michigan, have been executed by Major Poe, United States Engineers. About 316 acres were disposed of, realizing about \$100,000; there remain about 38 acres, a sufficient reservation.

On proper application, made November 5, 1870, anticipating disturbances, &c., likely to arise among a large body of workmen on the enlargement of the Sault Ste. Marie Canal—as an isolated spot, beyond the usual resources of remedy—the commanding officer of Fort Brady was at that date instructed to protect, if necessary, all public property with his whole force, and, if thought necessary, to furnish guards as a preventive measure. This order, being well known, had an excellent effect, and no call was made on the commanding officer.

In obedience to instructions from the War Department, the commanding officer of Fort Brady was directed, September 20, ultimo, to furnish the necessary force, upon application by the United States marshal, for the ejectment of squatters from the reservation at the Sault Ste. Marie Canal.

Desertions in July and August have been very numerous—one hundred and four. The chief causes seem all exceptional and temporary, viz: First, the reduction of about twenty per cent. of pay took effect July 1st. Second, a great regulation change in the settlement of clothing accounts, which involved the payment to the men in many instances of very considerable sums for clothing not drawn. Third, the assignment, just previous, of a large number of recruits, (their regular payments much affected, too, by the new regulation.) It is among new soldiers that desertions chiefly occur.

There have been sixty-two trials for this crime in the past year, but of this number twenty-three were cases of men belonging to other military departments, apprehended and tried in this.

Under the unlimited range of legal punishment for desertion, as is the case for nearly all military crimes, it is observed, by comparing the re-

sults in the different military departments, that the punishments inflicted vary five-fold in seventy.

The sentences in this department, generally two or three years of imprisonment, without pay, are about the average, or of medium severity.

I suggest a modification, making plainer the intent of the 22d Article of War. Under it it is held that the act of enlistment in another regiment, by an old deserter, is a new act of desertion; while the sentences of courts, generally, under the extreme range of punishment allowed, indicate a very different though varying construction.

I submit a mention of one other article of war, by the received construction of which one of the readiest and most appropriate punishments for a rather common offense is excluded. The 45th Article of War for drunkenness on duty accords "such corporal punishment as shall be inflicted by sentence of a court-martial." This has been decided, after a long contrary practice, to exclude the punishment of fines or stoppage of pay.

I have visited and inspected all the posts of the department in the past season. Decided improvement in discipline and in the quartering and other comforts of the troops was manifest. At Fort Niagara new frame buildings, for officers, have been built in the year, near the brick barrack for the men, outside of the fort, under the supervision of Major Alex. Montgomery, quartermaster—excellent and very commodious quarters, and for the small sum of \$7,800, which shows a manifest improvement in the scale of similar government expenditure.

The town of Ogdensburgh, New York, in the eastern extremity of this department, is a point of very suggestive strategic importance. It commands the navigation of the St. Lawrence, and is within easy cannon-shot range of the Grand Trunk Railway, and also of the terminus of the railway from the capital of the New Dominion, only fifty miles to the north. If occupied, such works as shall be decided on would serve as a better position for the troops now at Sackett's Harbor—the chief merit of their present one being thought to be their proximity to Ogdensburgh.

The number of claims for honorable discharge, bounty, and pay, by late volunteers, chiefly deserters in fact, received at these headquarters since my last report, is 119, (in the preceding year, 260;) the number of cases disposed of during the year, 112; leaving 57 under investigation.

Very respectfully, your obedient servant,

P. ST. GEORGE COOKE,

Brigadier General, Commanding.

Col. RICHARD O. DRUM,

Assistant Adjutant General, Military Division of the Atlantic.

REPORT OF MAJOR GENERAL HALLECK.

HEADQUARTERS MILITARY DIVISION OF THE SOUTH,
Louisville, Kentucky, October 27, 1871.

GENERAL: The geographical limits of this military division remain the same as they were at the date of my last annual report, embracing the States of Kentucky, Tennessee, Georgia, South Carolina, Florida, Alabama, Mississippi, Louisiana, and Texas. The last two States con-

stitute the Department of Texas, and the others the Department of the South.

I. DEPARTMENT OF THE SOUTH.

This department is commanded by Brigadier General A. H. Terry, headquarters at Louisville, Kentucky. The troops under his command consist of the Seventh Regiment of Cavalry, eleven companies of the Third Artillery, and the Second, Fourth, Sixteenth, and Eighteenth Regiments of Infantry. I respectfully refer to General Terry's report for details in regard to the movements of troops, and to posts occupied during the past year.

II. DEPARTMENT OF TEXAS.

This department is commanded by Colonel J. J. Reynolds, Third Cavalry, headquarters at San Antonio, Texas. The troops under his command consist of the fourth and ninth regiments of cavalry, and the tenth, eleventh, nineteenth, twenty-fourth, and twenty-fifth regiments of infantry. I respectfully refer to Colonel Reynolds's report for details in regard to the distribution, movements, and stations of the forces under his command. Attention is particularly invited to his remarks upon the depredations committed by Indians from the north of Red River and west of the Rio Grande.

III. GENERAL REMARKS.

Strong efforts have been made during the past year to reduce the military expenditures in this division, and these efforts have, in many cases, resulted in a more rigid system of economy. One of the largest items of expense is the cost of transporting troops and their supplies, as they are changed from one station to another, or sent into the field to assist civil officers of the General Government. This has been especially the case in the Department of the South. Many of these changes were made under orders direct from Washington, and their object and necessity are probably better known to the War Department than they are here.

I respectfully renew the recommendation heretofore made, that the powers and duties of officers in interfering in civil matters be more clearly defined by law and regulations. Officers are frequently ordered in general terms to assist certain civil functionaries in enforcing the civil laws, and these functionaries often expect them to perform duties which are entirely undefined, and which have heretofore been regarded as not within the power of the military to perform.

Very respectfully, your obedient servant,

H. W. HALLECK,
Major General, Commanding.

ADJUTANT GENERAL OF THE ARMY,
Washington, D. C.



REPORT OF BRIGADIER GENERAL TERRY.

HEADQUARTERS DEPARTMENT OF THE SOUTH,
Louisville, Kentucky, October 26, 1871.

SIR: In compliance with instructions received from division headquarters, of the 22d ultimo, I have the honor to submit the following

report of military operations in this department since October 10, 1870, the date of my last annual report:

At that date the troops in the department were the Second, Eighth, Sixteenth, and Eighteenth Infantry, and ten companies of the Third Artillery, occupying permanently the following-named posts, viz: Key West, Fort Jefferson, and Fort Barrancas, Florida; Atlanta, Savannah, Fort Pulaski, Warrenton, and Barnett's Station, Georgia; Columbia and Charleston, South Carolina; Huntsville, Mobile, Montgomery, and Tuscaloosa, Alabama; Chattanooga, Nashville, and Humboldt, Tennessee; Lebanon and Louisville, Kentucky; and Jackson, Mississippi. The following-named posts were at the same time temporarily occupied, viz: Newberry, Union, Abbeville, Edgefield, and Laurens, in South Carolina; and Eutaw and Patowa, in Alabama.

On the 16th of October, 1870, by telegraphic orders from the War Department, the Eighth Infantry was relieved from duty in this department, and on the 4th day of March, by General Orders No. 17, War Department, current series, the Seventh Cavalry and the Fourth Infantry were added to the troops here. Various changes in the disposition of the troops have been made, which will be hereafter alluded to; and at present the posts permanently occupied, and their garrisons, are as follows, viz:

KENTUCKY.

Taylor Barracks.—Company F, Seventh Cavalry; H, Fourth Infantry; and A and E, Sixteenth Infantry.

Frankfort.—Companies G and K, Fourth Infantry.

Lexington.—Company A, Fourth Infantry.

Crab Orchard.—Company D, Seventh Cavalry; and B, Fourth Infantry.

Paducah.—Company D, Fourth Infantry.

Mount Sterling.—Company E, Fourth Infantry.

Elizabethtown.—Company A, Seventh Cavalry; and F, Fourth Infantry.

Lebanon.—Companies C and I, Fourth, Infantry.

Shelbyville.—Company I, Seventh Cavalry.

Newport Barracks.—Recruiting depot.

TENNESSEE.

Nashville.—Company H, Seventh Cavalry; and F and G, Sixteenth Infantry.

Humboldt.—Company D, Sixteenth Infantry.

Chattanooga.—Companies E and I, Second Infantry.

MISSISSIPPI.

Jackson.—Companies B and H, Sixteenth Infantry.

Meridian.—Company I, Sixteenth Infantry.

Aberdeen.—Company C, Sixteenth Infantry.

ALABAMA.

Huntsville.—Company B, Second Infantry.

Mobile.—Companies G and K, Second Infantry.

FLORIDA.

St. Augustine.—Companies F and H, Second Infantry; and K, Sixteenth Infantry.

Key West.—Batteries B and D, Third Artillery.

Fort Jefferson.—Batteries F, L, and M, Third Artillery.

Fort Barrancas.—Battery G, Third Artillery.

GEORGIA.

Savannah.—Battery K, Third Artillery.

Fort Pulaski.—Batteries E and H, Third Artillery.

Atlanta.—Companies A and C, Second Infantry; and Companies A, E, and G, Eighteenth Infantry.

SOUTH CAROLINA.

Charleston.—Light Battery C, and Battery I, Third Artillery.

Columbia.—Companies B, D, and I, Eighteenth Infantry; and Companies G, L, and M, Seventh Cavalry.

Chester.—Company C, Seventh Cavalry; and Company H, Eighteenth Infantry.

Yorkville.—Company K, Seventh Cavalry; and Company C, Eighteenth Infantry.

Newberry.—Company K, Eighteenth Infantry.

Unionville.—Company B, Seventh Cavalry.

Spartanburgh.—Company E, Seventh Cavalry; and Company D, Second Infantry.

Sumter.—Company F, Eighteenth Infantry.

Troops temporarily detached from their proper stations:

Company F, Seventh Cavalry, from Taylor Barracks, Louisville, Kentucky—Meridian, Mississippi.

Company D, Seventh Cavalry, from Crab Orchard, Kentucky—Yorkville, South Carolina.

Company C, Fourth Infantry, from Lebanon, Kentucky—Lancaster, Kentucky.

Company A, Second Infantry, from Atlanta, Georgia—McKinley, Alabama.

Battery I, Third Artillery, from Charleston, South Carolina—Spartanburgh, South Carolina.

Company B, Eighteenth Infantry, from Columbia, South Carolina—Yorkville, South Carolina.

Company G, Seventh Cavalry, from Columbia, South Carolina—Yorkville, South Carolina.

Company L, Seventh Cavalry, from Columbia, South Carolina—Yorkville, South Carolina.

Company M, Seventh Cavalry, from Columbia, South Carolina—Spartanburgh, South Carolina.

Company C, Seventh Cavalry, from Chester, South Carolina—Rutherfordton, North Carolina, (Department of the East.)

The principal changes which have taken place in the distribution of the troops are as follows, viz: On the 17th of October, 1870, two companies of the Eighteenth Infantry were ordered to Columbia, South Carolina, and two companies of the same regiment to Charleston, South Carolina. These troops took the place of companies of the Eighth, which had been relieved. On the 21st of October, one company of the Eighteenth Infantry was ordered from Columbia to Newberry, South Carolina, and on the 22d one company of the Eighteenth was ordered from Charleston to Laurens, South Carolina.

On the 15th of November, 1870, the post of Tuscaloosa was discontinued, and its garrison was ordered to Montgomery, Alabama.

On the 15th of November, in obedience to orders from headquarters of the Military Division, one company of the Sixteenth Infantry was ordered to Lancaster, Kentucky.

On the 24th of November, in obedience to orders from division headquarters, one company of the Second Infantry was ordered from Mobile, Alabama, to Tallahassee, Florida, and one company of the same regiment was ordered from Montgomery, Alabama, to Tallahassee, Florida.

On December 15, the camp established by the garrison of Mobile at Mount Vernon Arsenal, Alabama, in September, 1870, and maintained during the prevalence of the yellow fever at Mobile, was broken up and the troops returned to their proper stations.

On the 25th of January, 1871, the posts of Warrenton and Barnet, Georgia, were discontinued, and their garrisons were ordered to Atlanta, Georgia.

On the 28th of January, the headquarters of the department, in pursuance of General Order No. 5, War Department, Adjutant General's Office, January 23, 1871, were transferred from Atlanta, Georgia, to Louisville, Kentucky.

On the 16th of February, one company of the Eighteenth Infantry was ordered from Columbia, South Carolina, to Unionville, South Carolina.

On the 20th of February, one company of the Second Infantry was ordered from Huntsville to Mobile, Alabama.

On the 24th of February, one company of the Eighteenth Infantry was ordered from Charleston to Yorkville, South Carolina.

On the 7th of March, 1871, in pursuance of instructions from the War Department, one company of the Third Artillery was ordered from Fort Jefferson, Florida, to Charleston, South Carolina.

On the 9th of March, three companies of the Eighteenth Infantry were ordered from Atlanta, Georgia, to Columbia, South Carolina; and on the same day one company of the Sixteenth Infantry was ordered from Jackson, Mississippi, to Meridian, in the same State.

On the 10th of March, one company of the Eighteenth Infantry was ordered from Columbia to Chester, South Carolina.

On the 11th of March, in compliance with instructions from the War Department, the headquarters of the Third Artillery were ordered from Key West, Florida, to Charleston, South Carolina.

On the 16th of March, the Companies C and I, Fourth Infantry, arrived in this department from the Department of the Platte; they were followed at different dates by the other companies of the regiment, and the regiment was distributed as follows, viz: The headquarters and two companies to Frankfort, one company to Louisville, one to Elizabethtown, one to Lebanon, one to Lancaster, one to Mount Vernon, one to Mount Sterling, one to Paducah, and one to Lexington, all in Kentucky.

On the 18th of March, two companies of the Eighteenth Infantry were ordered from Columbia, South Carolina, to Atlanta, Georgia.

On the 21st of March, the first detachment of the Seventh Cavalry, consisting of Companies B, E, and K, arrived in Louisville from the Department of the Missouri, and were ordered respectively to Unionville, Spartanburgh, and Yorkville, South Carolina; this detachment was followed at different times by the remaining companies of the regiment, and they were assigned to the posts of Louisville, Elizabethtown, Bagdad, and Mount Vernon, Kentucky; Nashville, Tennessee; and Chester, Sumter, and Columbia, South Carolina. The headquarters of the regiment were established at Louisville.

On the 31st of March, one company of the Eighteenth Infantry was ordered from Unionville to Laurensville, South Carolina.

On the 28th of April, 1871, Light Battery C, of the Third Artillery, reported at Louisville from the Department of Missouri, and was ordered to Charleston, South Carolina.

On the 15th of May, one company of the Eighteenth Infantry, from Atlanta, Georgia, and one of the Second Infantry, from Huntsville, Alabama, were ordered to Columbia, South Carolina.

On the 22d of May, one company of the Eighteenth Infantry was ordered from Columbia to Sumterville, South Carolina.

On the 5th of June, two companies of the Seventh Cavalry were transferred from Columbia to Darlington and Winnsboro', South Carolina.

On the 9th of June, one company of the Sixteenth Infantry was transferred from the post of Nashville, Tennessee, to Tallahassee, Florida.

On the 23d of June, in pursuance of orders from the major general commanding the division, one company of cavalry was sent from Chester, South Carolina, to Rutherfordton, North Carolina, in the Department of the East; and on the same day one company of the Sixteenth Infantry was ordered from Nashville, Tennessee, to Oxford, Mississippi.

On the 30th of June, the post of Tallahassee, Florida, was discontinued, the garrison being transferred to St. Augustine, Florida.

On the 20th of July, the post of Montgomery, Alabama, was discontinued, its garrison being transferred to Atlanta, Georgia, and on the same day Company F, Seventh Cavalry, was ordered from Louisville, Kentucky, to Meridian, Mississippi.

On the 1st of August, in pursuance of instructions from the War Department, Company G, Seventh Cavalry, was ordered from Sumter, South Carolina, to Atlanta, Georgia.

On the 2d of August, Company H, Sixth Cavalry, arrived in this department from the Department of Missouri, and took post at Aberdeen, Mississippi.

On the 2d of September, one company of the Eighteenth Infantry was ordered from Atlanta, Georgia, to Columbia, South Carolina.

On September 11, the post of Bagdad was discontinued, the company stationed there being transferred to Shelbyville, Kentucky.

On September 13, the company of the Seventh Cavalry, stationed at Mount Vernon, Kentucky, was transferred to Columbia, South Carolina.

On the 4th of October, 1871, the post of Mount Vernon was discontinued, its garrison being transferred to Crab Orchard, Kentucky.

On the 9th of October, Company G, of the Seventh Cavalry, was ordered from Atlanta, Georgia, to Columbia, South Carolina.

On the 12th of October, in obedience to orders from division headquarters, four companies of infantry, from the garrisons at Louisville, Frankfort, and Elizabethtown, were ordered to Chicago, Illinois, to report to Lieutenant General Sheridau, commanding the Military Division of the Missouri.

In addition to these principal changes in the stations of the troops, more than two hundred temporary detachments have been made from the garrisons of posts for the purpose of aiding civil officers. These detachments have been made upon the request of governors of States, sheriffs, and other local State civil authorities, and United States district attorneys, marshals, and officers of the Internal Revenue Department. In a very great number of cases these civil officers would not have been able to perform their duties without military protection. I have yet to hear of any case in which the officers and men assigned to

this difficult and delicate service have failed to perform their duties in a perfectly satisfactory manner.

During the past year the troops have been supplied with subsistence, excepting fresh beef, as follows, viz: Lebanon, Frankfort, Lexington, Elizabethtown, Mount Sterling, Mount Vernon, Nashville, Chattanooga, and Humboldt, from Louisville, Kentucky; Meridian, Aberdeen, and Jackson, from Louisville and New Orleans; Atlanta, from Louisville and New York; Columbia, Charleston, Savannah, Fort Pulaski, St. Augustine, Key West, and Fort Jefferson, from New York; Mobile and Fort Barrancas, from New Orleans; Winnsboro, Union, Newberry, Spartanburgh, Yorkville, and Chester, from Columbia; Laurensville, Sumter, and Darlington, from Charleston. Fresh beef has, of course, always been procured in the neighborhood of the posts respectively. As a rule, the supplies of subsistence have been ample in quantity and of excellent quality. Quartermasters' supplies have been furnished to the posts as follows, viz: The posts in Kentucky and Tennessee, and the post of Atlanta, from Louisville, and the depot at Jeffersonville, Indiana; Fort Pulaski and Savannah, Georgia, St. Augustine, Florida, and the posts in South Carolina, from the depot at Charleston, South Carolina, and Jeffersonville, Indiana; Key West and Fort Jefferson, Florida, from New York; Fort Barrancas, Florida, from New Orleans; the posts in Mississippi, from New Orleans and the Jeffersonville depot.

The health of the troops in all the posts of the department, permanent and temporary, has been remarkably good, with some few exceptions in the malarious districts of South Carolina and Mississippi. The posts on the Gulf have been free from epidemic yellow fever. At Charleston, South Carolina, this disease has prevailed, but as soon as it appeared the garrison of that post was transferred to Summerville, where it now remains in a healthy condition. Similar action has been taken at Jackson, Mississippi, where the fever exists at the present time.

I inclose the reports of the post commanders as far as they have been received. The posts from which no reports have been made are Key West and Fort Jefferson, Florida. When these reports are received they will be forwarded.

I have the honor to be, very respectfully, your most obedient servant,

ALFRED H. TERRY,

Brigadier General, United States Army, Commanding.

The ASSISTANT ADJUTANT GENERAL,

Headquarters Military Division of the South.

Louisville, Kentucky.

REPORT OF COLONEL J. J. REYNOLDS.

HEADQUARTERS DEPARTMENT OF TEXAS,

(TEXAS AND LOUISIANA,)

San Antonio, Texas, September 30, 1871.

SIR: I have the honor to submit the following report of this department for the year ending this date:

The present force consists of two regiments of cavalry, the Fourth and Ninth, and five regiments of infantry, the Tenth, Eleventh, Nineteenth, Twenty-fourth, and Twenty-fifth.

Since the date of the last annual report, the Sixth Regiment of Cavalry has been removed from the department.

The Nineteenth Regiment of Infantry is stationed in Louisiana, six companies at Baton Rouge and four companies at Jackson Barracks, adjoining the city of New Orleans.

The troops in Texas are distributed at the frontier posts with the exception of three companies, one at Austin, infantry, and two at San Antonio, one infantry and one cavalry.

At convenient stations between the principal posts on the Indian frontier, from Red River to the Rio Grande, sub-posts are established, of one company each, on picket duty. These posts are relieved about once in thirty days.

One-half the effective force of each principal post, alternating, is kept in the field. This plan, independent of larger special expeditions, causes the troops to be almost continually in motion, and extends the greatest protection possible to the frontier counties with the force at hand.

The most serious depredations on the western frontier have been committed by Indians from the reserves north of Red River. One of these raiding parties, in the month of May last, attacked a contractor's train near Fort Richardson, killed seven men and captured forty animals. Prompt pursuit was made, but without overtaking the Indians. They were followed to the Fort Sill reservation, however, where they had already boasted of their exploits in Texas. The General of the Army was opportunely present, and ordered that the three principal chiefs, Satauk, Satanta, and Big Tree, be arrested and returned to Texas for trial by the civil courts of the State. The first-named, in attempting to escape from the guard, was killed. The other two were duly tried and sentenced to be hanged. Their sentence was commuted by the governor of the State to imprisonment for life in the State penitentiary. They are now *en route* to the penitentiary, under strict guard.

On the arrest of the above-named chiefs, the Kiowa Indians left their reservation. The available force of Forts Richardson, Griffin, and Concho was placed in the field, under Colonel R. S. MacKenzie, Fourth Cavalry. This command left Fort Richardson on the 2d of August last. A portion of this force returned to Fort Richardson about the 15th instant. The remainder is still in the field west of Fort Griffin.

The agent reports that the Kiowa Indians have returned to their reservation, and have restored or made good the animals stolen from the train near Fort Richardson.

The condition of the Rio Grande frontier remains unsettled, and has not materially changed during the year. Attention is respectfully invited to my last annual report on this point, and especially to communications dated June 27 and July 28, 1871. The evidence is clear that the remnant of Kickapoo Indians, now living in Mexico, are prevented from removing north of Red River and rejoining their tribe, by the officials of the Mexican government. On this account, the mission of the delegation of Indian chiefs from the main Kickapoo tribe to their brethren in Mexico last summer was fruitless.

Efforts will not be relaxed to effect the removal of these Indians from Mexico. Until their removal shall have been accomplished, there is no apparent ground to hope for permanent quiet on the Rio Grande frontier. A continuance of the present state of affairs must endanger the peaceful relations of the two governments.

I respectfully renew my previous recommendations with regard to the employment of a limited number of frontiersmen and the furnishing of sufficient wire to connect the frontier posts by telegraph. This will, it is believed, insure cordial co-operation between the frontier people and

the troops; also prompt support to each other on the part of the posts, at present impossible.

I am, sir, very respectfully, your obedient servant,

J. J. REYNOLDS,
*Colonel Third Cavalry, Brevet Major General,
United States Army, Commanding.*

ASSISTANT ADJUTANT GENERAL,
*Headquarters Military Division of the South,
Louisville, Kentucky.*

REPORT OF MAJOR GENERAL SCHOFIELD.

HEADQUARTERS MILITARY DIVISION OF THE PACIFIC,
San Francisco, California, October 20, 1871.

SIR: I have the honor to report as follows the operations of this military division during the last year:

The Division of the Pacific embraces the three departments of California, the Columbia, and Arizona; the first comprising the State of California, except the extreme southern portion, and the State of Nevada; the second, the State of Oregon and the Territories of Washington, Idaho, and Alaska; the third, the Territory of Arizona and the southern portion of California. The Department of California is commanded by Brigadier General E. O. C. Ord, that of Columbia by Brigadier General E. R. S. Canby, and that of Arizona by Lieutenant Colonel George Crook, who relieved Colonel George Stoneman on the 4th of June, 1871.

The troops in the division are the Twelfth, Twenty-first, and Twenty-third Regiments of Infantry, the First and Third Regiments of Cavalry, and eleven companies of the Second Artillery. Total strength, according to the present legal standard, 4,500 men; actual strength present for duty, about four thousand men.

These troops are distributed as follows: In the Department of California, three companies of cavalry, six companies and one light battery of artillery, and six companies of infantry; in the Department of the Columbia, one regiment and one company of infantry, four companies of cavalry, and four companies of artillery; in the Department of Arizona, one regiment and five companies of cavalry, and one regiment and three companies of infantry.

For the details of military operations and of administrative business, reference is made to the accompanying reports of the department commanders and of the chief staff officers of the division.

In the Departments of California and the Columbia, no serious Indian difficulties have occurred during the last year. The affairs of these departments have been wisely and economically administered, the expenditures having been kept quite within the limits of the congressional appropriations.

In the Department of Arizona a state of war with the Apache Indians has existed uninterruptedly for many years. Hence the troops have been almost constantly in the field, incurring the extraordinary losses and expenses incident to war, always much greater than the ordinary expenses of troops in camp or garrison.

The remoteness of this scene of hostilities from the sources of supply, necessitates very large expenditures for transportation, thus rendering the cost of supporting troops, aside from the extraordinary expenses of

war, very much greater than it is near the sources of supply. The necessary result is, that whether the troops in Arizona are few or many, their cost per man must be much greater than the average of the entire Army, which disproportion is still more increased by the cost of constant active operations against the Indians.

During the years 1869 and 1870, in accordance with the policy of the Government, a large proportion of the Apache Indians were collected upon temporary reservations at Camps Apache, Grant, Verde, and Date Creek, and there seemed a fair prospect of success in the efforts to localize all the Arizona Indians and secure lasting peace in that Territory. But some small bands still remained at large, committing depredations wherever opportunity offered; and doubtless advantage was taken, in some cases, of the reservations as places of refuge after committing robbery or murder. At least the belief that this was the case is given as an excuse for acts on the part of some of the people of Arizona no less barbarous than those which characterize the Apaches.

It is worthy of remark that these Indians paid for a large part of the rations issued to them by supplying hay and wood to the military posts, that the wood and hay thus furnished cost the Government much less than before paid to contractors, and that the contractors, their employes, and customers thus lost the profits theretofore realized. It has been suggested that this may explain the Camp Grant massacre, hereafter referred to.

The meagre appropriations for the Quartermaster's Department for the years 1870-71, rendered necessary a great reduction of expenses in Arizona. The process of reduction was promptly commenced by withdrawing a portion of the troops, abandoning unnecessary posts, breaking up expensive depots that could be dispensed with, and by general economy in administration.

Immediately following the inauguration of this process of reduction, reports of Indian outrages in Arizona were multiplied, and loud protests arose from the people of that Territory, accompanied by denunciations of the department commander. A large camp of Indians near Camp Grant, where they had gone upon the invitation of the department commander, was surprised and attacked by a party of citizens from Tucson, assisted by friendly Indians. A large number of old men, women, and children were killed, and many others carried off captive.

The warriors nearly all made their escape. A few days' later intelligence was received from Camp Apache that a large part of the White Mountain Apaches near that post had broken out in open war. In spite of all our efforts to prevent it, a general war with the Apache Indians seemed again inevitable. Under these circumstances there appeared no other course but to retrace the steps that had been taken in the interest of economy, and place the force in Arizona upon an efficient footing.

Colonel George Stoneman, Twenty-first Infantry, having been by the President's order of May 2, 1871, relieved, and Lieutenant Colonel George Crook, Twenty-third Infantry, assigned to the command of that department, orders were given for the re-enforcement of the troops to about their original strength, and the department commander was furnished with the necessary means and given full authority to prosecute such military measures as the emergency might render expedient.

The vigorous measures promptly adopted by the department commander were sufficient to deter the large majority of the Indians from engaging in the war, while the efforts of the Indian commissioner and officers of the Army to convince the Indians of the good faith and humane purpose of the Government seem to have been fully successful.

It is reported that nearly all of the Arizona Apaches have gone upon the reservations designated for them, and hopes are entertained of a lasting peace.

If these hopes are realized it will be practicable, at no distant day, to make a considerable reduction of the force in Arizona, and a corresponding reduction of expenses. But pending the present experiment it would be unwise to diminish the number of troops or impair their efficiency by withholding the means necessary to active operations. Past experience does not justify the hope of a very rapid improvement in the character and habits of such people as the wild Apaches, or that any improvement can be effected without the restraining influence of an efficient active force, strong enough to make it dangerous for the savage to return to his former habits.

Experience in Arizona has also shown that the constant presence of a considerable military force is equally necessary to protect the Indians upon reservations from their white neighbors.

The cost of the military establishment in the Department of Arizona for the fiscal year ending June 30, 1871, was somewhat more than three millions of dollars, and this is much less than the annual cost for many years before. The returns of the late census, which are not at my command, will doubtless show what proportion the net results bear to this vast expenditure of money.

Heretofore a large majority of the few settlers in Arizona have had no other means of support than that afforded them by the Army, and had the Army been withdrawn a large proportion of the settlers would probably have left the country, even if not driven out by Indians. More recently there are indications of greater prosperity.

Some valuable mines have been discovered, and great energy is displayed by the pioneers in exploration of the country and prospecting for precious minerals, although with no great success thus far. Some beds of excellent coal have been discovered, and there are tracts of fine timber, grazing, and agricultural lands. At some future time Arizona may be the home of a considerable and prosperous population. Unfortunately we have anticipated by many years the demands of our people for new territory, and have expended many millions of dollars in the military occupation of Arizona before the country was actually needed, or could be profitably occupied, by our advancing population. The money thus expended for many years was little better than wasted. To continue an inefficient occupation of the Territory would be but to continue this waste. Either the troops should be withdrawn from the unsettled portions of the Territory, or else they should be maintained in full condition for active service, so that the hostile Indians may be speedily subdued, and the Territory freely opened to settlement.

It is perhaps now too late to change the policy so prematurely adopted. The interests and hopes that have arisen from the military occupation make it difficult to abandon any portion of the country now occupied. The only course seems to be to persevere until the Indians are subdued. General Crook regards the force now in his department as sufficient for the purpose, if kept well mounted and fully supplied with the means for active operations. This will require a total expenditure somewhat greater than three millions per annum; or for the Quartermaster's Department about two millions; the latter being about two and one-half times the rate of appropriation for the entire Army for the present fiscal year.

The want of telegraphic communication with the headquarters and principal stations of troops in the Department of Arizona is a source of

embarrassment, delay, and expense. I recommend that the necessary Government aid be given to some telegraphic company to enable it to extend its lines to Prescott and other important points in the Territory.

I approve the recommendation of Brigadier General Ord that the necessary appropriations be made for the construction of barracks and quarters at posts in the Department of California, and for the erection of a new post on the line of the Pacific Railroad, to replace Camp Halleck; also for the improvement and protection of the reservations at the Presidio and Point San José, San Francisco.

Attention is respectfully invited to the report and recommendations of Brigadier General Canby relative to the provision necessary to be made for the support of Indians whose means of subsistence have been destroyed by the continually advancing white settlements.

Both justice and wise policy dictate prompt and liberal action by Congress in this matter. We have driven the Indians from their native hunting-grounds, and have appropriated them to our own use. These lands are vastly more valuable to us than they were to the natives. The least we can do in justice is to pay the Indians the value of the land to them; that is, enough to supply their simple wants of food and clothing. The only alternative is war, with its vastly greater cost, sacrifice of life and property, and final extermination of the Indians.

These considerations apply as well to Indians in the Departments of California and Arizona. Liberal provision should be made to supply their present wants, and enable them to adopt civilized habits and become self-supporting.

I believe it would be to the interest of the Government to restore the pay of enlisted men to the rates which existed previous to the present fiscal year.

I am, general, very respectfully, your obedient servant,
 J. M. SCHOFIELD,
Major General, Commanding.
 To the ADJUTANT GENERAL, U. S. A.,
 Washington, D. C.

REPORT OF BRIGADIER GENERAL ORD.

HEADQUARTERS DEPARTMENT OF CALIFORNIA,
San Francisco, October 13, 1871.

SIR: In accordance with instructions dated September 18, 1871, I have the honor to submit my annual report of operations in the Department of California.

The department embraces, in the States of Nevada and California, six posts in a country more or less occupied by Indians, namely, Camps Gaston, Wright, Bidwell, McDermit, Halleck, and Independence; also one cavalry headquarters, depot, and rendezvous at Benicia Barracks, California; one artillery headquarters, garrison, and rendezvous at Presidio of San Francisco, California; one infantry headquarters, garrison, and rendezvous at Angel Island, California; one garrison and prison for military convicts at Alcatraz Island, California; one garrison for the works at Point San José; and the guard for the quartermaster's depot at Yerba Buena Island, California.

During the last year Camp Winfield Scott, in Nevada, about thirty miles south of Camp McDermit, has been abandoned, the valley in

which it was situated having become so well settled as to render the neighboring post of Camp McDermit sufficient for all that portion of Nevada. Camp Tulare was also established, under instructions from the Adjutant General's Office, at Tule Indian Farm, on the Tule River, California, the Indian reservation or farm having become obnoxious to the settlers of that vicinity; but all apprehensions of serious trouble having ceased, the garrison, Captain Platt's company, Second Artillery, under command of Lieutenant Vose, was returned to the Presidio of San Francisco.

By Special Orders No. 141, Military Division of the Pacific, dated September 2, 1871, the part of Southern California then occupied by disaffected Indians was temporarily assigned to my command. The difficulties among the Indians having been acted upon by the superintendent of Indian affairs for this State, the troops which had been called for by the Indian Department were returned to their proper stations.

Two troops of the First Cavalry, (McGregor's and Carr's,) which at the end of last year garrisoned Camps Bidwell and McDermit, have been sent to Arizona, and replaced by Bernard's and Wagner's troops from that department. The headquarters of the Third Cavalry and Curtis's troop, which at the beginning of the year was at Camp Halleck, also Henry's troop of same regiment, temporarily at the same post, have also been ordered to Arizona, and replaced by Biddle's troop of the First Cavalry from that Territory.

Six heavy and Ramsey's light battery of the Second Artillery, are employed as follows: Williston's and Platt's batteries, (the latter under the command of Lieutenant De Russey,) with a detachment of Battery H, under Lieutenant Rogers, and Ramsey's light battery, garrison the Presidio of San Francisco, including Fort Point; the whole under the command of Lieutenant Colonel French, who commands the regiment. Ramsey's light battery has not been mounted since its arrival on this coast, but horses are now being purchased, and it is expected that it will soon be in efficient condition as a light battery. The public buildings and grounds of this command have been placed in as good condition as the limited means allowed the post commander would permit. Elsewhere attention is called to the importance of erecting permanent barracks, and of appropriating funds for the protection and improvement of the reserve at this important station.

Captain Rogers's battery garrisons the works at Point San José in this harbor. This post, under the management of Captain Rogers, has also been much improved during the last year.

Robertson's and Woodruff's batteries, under the efficient command of Captain Robertson, garrison the works at Alcatraz Island, and have charge of the military prison there, at which the convicts from the whole division of the Pacific are undergoing sentence. During the past year the accommodations for the convicts have been enlarged as their number increased. A separate mess-house has been built for them, and new quarters prepared for an additional battery, all at a small outlay.

A board of officers was sent by me to visit the State prison at San Quentin, and see if there was anything in the prison system there which might with propriety be introduced at Alcatraz. The board reported that after a careful examination they found nothing in the system, the accommodation, or treatment of the convicts, sick or well, at that prison that was equal to what was already provided and practiced at Alcatraz. The convicts at Alcatraz work hard, mainly on the fortifications now being constructed there. A system of legitimate rewards and punishments is enforced among them, and produces the best results.

Under the recent law for the reduction of the Army, a company consists of but a handful of men, and company commanders are all the more anxious not to lose the services of a single man, for this reason. The usual punishment for desertion, which has been found efficient in preventing it on this coast—two years' confinement at hard labor at Alcatraz, and then to be dishonorably discharged—is not likely to be imposed hereafter, for it reduces a company for every deserter so punished that much; but the convicts now there are nearly all still borne on the company rolls, though they form no part of the available force of the Army, and it is presumed that Congress, when it reduced the Army to 30,000 men, intended they should be available for service. I would, therefore, earnestly recommend that any convicts now at this military prison, or to be hereafter sent there from the Army, be by law especially excluded from the number of enlisted men authorized by the recent law fixing the military establishment.

The portion of the First Cavalry stationed in this department is employed as follows: The headquarters under the regimental commander, Colonel Gillem, is at Benicia Barracks, which is also a rendezvous for cavalry recruits, and a depot where dismounted cavalry companies have been sent to recruit and refit for the field. Bernard's troop garrisons Camp Bidwell, at the head of Surprise Valley, California. This valley, although well settled, is a place of much resort for Pintes and other Indians. Wagner's troop garrisons Camp McDermit, in Quinn's River Valley, California, over and in the vicinity of which the Piute Indians roam and try to subsist. The mail and stage line from Winnemucca to Silver City, Idaho, passes this post. Biddle's troop partly garrisons Camp Halleck, which is about twelve miles from the Central Pacific Railroad, and in a country more or less the resort of Indians. Detachments from this post are ready when required to protect the Central Pacific Railroad, over which they can be sent with tolerable facility to any threatened point.

The portion of the Twelfth Infantry stationed in the department is employed as follows: The headquarters, under the regimental commander, Colonel Willcox, and Stacey's company, are stationed at Angel Island, which is also a rendezvous for infantry recruits and casuals. Parker's and Tripler's companies, under the command of Lieutenant Colonel Nelson, of this regiment, garrison Camp Gaston, which is located on the Indian reservation in Hoopa Valley, California, and in the neighborhood of large numbers of Indians of Northern California, who are at present peaceable. Woodruff's company garrisons Camp Wright, California, which guards the Round Valley Indian reservation, where the Indians are still numerous, but at present provided for and peaceable. Thompson's company partly garrisons Camp Halleck, Nevada, under the command of Captain Biddle, as already mentioned. Egbert's company garrisons Camp Independence, in Owen's River Valley. This valley is bountifully irrigated by the torrents that pour down from the great wall of the Sierra Nevada on its western side; but beyond the valley to the east is the most forbidding and desolate portion of the great American desert. The post lies nearly midway between the settlements on the Central Pacific Railroad to the north about 275 miles, and those of Los Angeles about 250 miles to the south. The mountains in the neighborhood of this valley are being rapidly prospected, with valuable results, in both gold and silver mines, some of which are now being profitably worked; and as the deserts to the east are explored, new and valuable discoveries are being made, so that, besides being one of the remote frontier stations, this is one of the most important in the State. The

valley and its vicinity being still used and frequented by wild Indians, the garrison should be a force of at least one company; and if it could be spared, I would recommend it be increased by a troop of cavalry, detachments from which could scout the desert to the east, and enable prospecting parties of citizens to extend their explorations over new and doubtless rich mineral districts.

Measures were taken during the year to send out from frontier posts frequent expeditions, so as to familiarize the troops with their proper duties, and with the country occupied; to obtain maps and information of those parts of it still unexplored or imperfectly known; to ascertain the habits, haunts, number, and condition of the Indians, and the locations and resources of the settlers and miners.

The business of the soldier, in time of war, being to hurt somebody with his gun, now is a good time to learn how to do it; therefore, target practice is being kept up at every station. But the troops are still deficient in accuracy of firing, and a more liberal allowance of ammunition than that prescribed in War Department, General Orders No. 50, of 1869, for this purpose, would, I think, be a benefit to the service. Post schools for enlisted men have also been encouraged, as far as the matter rested with the department commander, for the benefit of those wishing to receive instruction.

In consequence of the limited amount of money appropriated, it has been necessary to practice severe economy. The troops at several of the posts are compelled to live in dilapidated or insufficient quarters. Such is the case at Camps Halleck and Gaston. At the Presidio of San Francisco, where temporary shelters were built during the war, new and more substantial quarters for the enlisted men are needed, as the post possesses probably as great a degree of permanence as any on the coast. The military reserve at this post has been quite an eyesore to the numerous parties who think they have, or might be able to get, some color of title to the land, in case it should be partially abandoned by the Government. Cut up into homestead lots, it would be quite a speculation; but the Engineer Department have begun a system of important earth-works, which, if a powerful force were to attempt the attack of this city by sea, would be necessary to defend it. The city, as it now stands, faces the bay on the east, with the space between the city and the ocean to the west occupied for about two miles by this military reserve; so that, should an enemy's fleet attempt to bombard the city from the ocean, without coming into the bay, these two miles of high hills, crowned with forts, would lay between them and their prey. But turn these hills over to speculators, and efforts would be made to extend the city westward to the ocean, where a bombarding fleet could sail up to and shell it. This is one of the reasons why the space occupied by the reservation, if it were not required for permanent works, should be held by the military. The Presidio and Point San José reserves, where not occupied by forts or barracks, are unimproved, and the sand, especially on Point San José, is driven by the fierce west winds of summer toward and upon the city of San Francisco, burying houses and lots in its course many feet deep. Other governments have utilized and improved similar wastes of sand, far more extensive than these, which bordered valuable lands, and threatened to submerge them, simply by planting trees or shrubs that would grow on such soil. An appropriation by Congress of \$20,000, judiciously expended in planting trees upon, and erecting barriers to, the drifting sands, would be of great advantage to the city, and convert the reserves, now shifting and neglected deserts, into ornaments to the city.

During last summer there appears to have been a general movement among the Piute Indians in the neighborhood of the posts in the Indian country, in both Nevada and California. Indians disappeared from their usual haunts, and were heard of through petitions from alarmed settlers for protection in Northeastern and Northern California. On investigation, the migration appears to have been caused by a scarcity of fish, grasshoppers, and other food, due to the last two dry winters. So far the migratory parties have committed no damage. A very considerable number of the more settled Indians in this department labor for the white inhabitants with creditable industry, earning a livelihood. On the southern coast of California, where there is no reservation, this is the only labor the large vine-growers and stock rancheros have.

It will be seen from this report that all the troops in this department away from the bay of San Francisco are stationed either on Indian reservations or in country more or less occupied by the Indians. Officers and soldiers are directed to protect them, and at the same time prevent, as far as practicable, depredations upon the settlers and miners. These duties require that the officers should familiarize themselves with the interests and habits of both whites and Indians; should study and scout over the country; and they are frequently, in the absence of any agent of the Indian Department, called on to settle difficulties so as to prevent collisions that are bound to occur where the interests are so conflicting. In severe seasons, or when the roots and game fail, and the Indians are actually suffering for food, as a measure of simple humanity, and to prevent the starving Indians killing the stock of the settlers, post commanders are authorized by me to issue to those Indians actually suffering for food, a little meat and a small allowance of flour. These issues are not appropriated for in the Army appropriations, and, in the aggregate, at all the posts in the Indian country they amount to quite an item. In making this issue, which is sometimes done by the post commanders without orders, there is no disposition to assume duties of Indian agents, for it is only done where there are no agents, and no provisions made for the needy Indians. The long and continuous service of Army officers among the Indians, while it enables them, when asked, to contribute valuable information to the Indian Department, does not contribute to any desire, on their part, to assume the difficult and thankless duties of Indian agents.

I cannot conclude my report without calling attention to the effect of the reduction in the pay of the enlisted men from \$16 to \$13 per month, that began at the beginning of the present fiscal year. This is felt very much in this department, where currency is not current money at all, but must be converted into coin, often at great loss, before anything can be purchased. I am satisfied that this reduction of pay has lost, and may yet lose the Government many excellent soldiers, by preventing re-enlistments, and by inducing desertions of men who may think that the reduction of their pay since their enlistment is in violation of the contract under which they enlisted.

I inclose herewith a copy of the last roster of troops in my department, which shows in detail the distribution. Also, estimates for permanent barracks for the enlisted men at the presidio of San Francisco; and should the site, for the sake of economy and convenience, be changed to a point on the Central Pacific Railroad, for quarters for officers, and other buildings that would become necessary, at or near Camp Halleck, Nevada; for officers' quarters at Point San José, there being only two sets of quarters (for two company officers) now at the

post, and one of these having been reported untenable; also, for new quarters for the enlisted men at Camp Gaston.

Very respectfully, your obedient servant,

E. O. C. ORD,

Brigadier General, Commanding.

Lieutenant Colonel JOHN C. KELTON,

Assistant Adjutant General,

*Headquarters Military Division of the Pacific,
San Francisco, California.*

REPORT OF BRIGADIER GENERAL CANBY.

HEADQUARTERS DEPARTMENT OF THE COLUMBIA,

Portland, Oregon, October 11, 1871.

SIR: I have the honor to submit, for the information of the major general commanding the division, the following report of operations in this department during the past year:

In pursuance of the orders referred to in my report of October 3, 1870, the posts of Forts Tongass, Wrangell, Kodiak, and Kenay, Alaska, have been abandoned, and Companies F, G, H, and L, Second Artillery, and the headquarters of the First Cavalry, transferred to the Department of California. Under subsequent orders, Companies M, Second Artillery, and E, First Cavalry, joined from, and D, First Cavalry, have been transferred to that department. The changes within the department have been as follows: Company C, Second Artillery, from Fort Stevens to Sitka; Company E, Second Artillery, from Fort Tongass to Fort Cape Disappointment; Company B, First Cavalry, from Camp Warner to Fort Klamath, and Company F, First Cavalry, from Camp Harney to Camp Warner; the headquarters of the Twenty-third Infantry, from Portland to Fort Vancouver; Company A, from Camp Three Forks, Owyhee, to Fort Boise; Company C, from Camp Harney to Fort Vancouver; Company E, from Sitka to Fort Lapwai; Company H, from Fort Boise to Vancouver, and Company I, from Camp Warner to Camp Harney. The post at the Three Forks of the Owyhee was abandoned August 28, 1871, and the public property not sold transferred to the Vancouver depot and Fort Boise.

The force now in the department is four companies of cavalry, four of artillery, and eleven of infantry, with an aggregate strength (September 1, 1871) of 1,227, and is distributed as follows:

Fort Stevens, Oregon.—Company M, Second Artillery.

Fort Klamath, Oregon.—Company B, First Cavalry, and Company K, Twenty-third Infantry.

Camp Warner, Oregon.—Company F, First Cavalry, and Company B, Twenty-third Infantry.

Camp Harney, Oregon.—Company H, First Cavalry, and Company I, Twenty-third Infantry.

Fort Hall, Idaho.—Company C, Twelfth Infantry.

Fort Boise, Idaho.—Company A, Twenty-third Infantry.

Fort Lapwai, Idaho.—Company E, First Cavalry, and Company E, Twenty-third Infantry.

Fort Colville, Washington Territory.—Company G, Twenty-third Infantry.

Fort Vancouver, Washington Territory.—Headquarters, and Companies C, D, and H, Twenty-third Infantry.

Fort Cape Disappointment, Washington Territory.—Company E, Second Artillery.

Camp San Juan Island, Washington Territory.—Company F, Twenty-third Infantry.

Sitka, Alaska.—Companies C and I, Second Artillery.

The changes in the *personnel* during the year have been as follows:

Gain.		Loss.	
By recruits	719	By transfer	470
By transfer	299	By discharge	583
From desertion	73	By desertion	268
		By death	17

Three hundred and twenty-seven of the discharges were under the operation of the law of July 15, 1870, 29 by order, 143 by expiration of enlistment, 60 for disability, and 24 by sentence of courts-martial. The number of desertions during the year has been large, and is due in great measure to mining excitements, the high wages paid to laborers in civil life, and to the reduction of the pay of enlisted men—nearly one-third of the whole number occurring in the two months immediately succeeding that reduction.

The standard strength of the companies now serving in the department is 1,256. This force has not been sufficient to meet fully the requirements of the past year, but the known necessities of the service in other departments have heretofore deterred me from asking for any increase. The reasons that make such an increase desirable are the constant extension of the frontier settlements, and the necessity for a more immediate and constant supervision of the Indians, who are brought into contact with the whites, and it is now recommended that the cavalry force of the department be increased by two companies as soon as they can be spared from other quarters.

While the relations with the Indians within the limits of the department have generally been satisfactory, there have been some difficulties that required the intervention of the troops to avert more serious trouble, and there were at one time indications of grave difficulties with the Indians of Southern Oregon and of Idaho. The measures taken have served to allay the apprehensions of the settlers, and to impress upon the Indians (for the present, at least) the importance and necessity of good conduct. Some of the complaints against these Indians were found to be entirely unfounded, and in some others greatly exaggerated, while in the remaining cases the acts complained of were confined to individual Indians, or small parties, moved by whisky or the pressure of hunger, to disorderly conduct or to depredations upon the stock of the settlers.

In a few instances these depredations assumed the shape of retaliation for the loss or destruction of their accustomed food by the occupation of their lands by the whites.

The Indians who occasioned these difficulties belong to bands that are entirely distinct and widely separated, and there is no evidence of any combination for hostile purposes, although the identity of time and cause gave an appearance of concerted action, and naturally created much uneasiness and apprehension among the settlers.

The material cause of all these troubles, the scarcity of food for the Indians, is one that grows in importance with the growth of the country, and the measures that should be adopted for the purpose of averting the dangers which it threatens requires serious consideration and early action. The country occupied by these Indians is almost entirely destitute of game, and their main reliance for food is fish and the seeds

of the wocos, and the roots of the camas, kous, and lou-lou. From some cause, probably the settlement of the country below, the supply of fish in the upper rivers is diminishing year by year, and the lands that produce the seeds and roots that constitute their only other reliance for food, present the most desirable and indeed almost the only locations for settlement, and are being rapidly appropriated for that purpose.

As an inevitable result, their supplies of food will soon be entirely cut off or so materially abridged that, unless their physical wants are supplied from some other source, they must starve or steal.

It is not difficult to determine which alternative will be adopted by the Indians nor to foresee the results that will follow.

For these reasons it is earnestly recommended that Congress be asked to give effect to the proposed policy of establishing these Indians on reservations in Southeastern Oregon and Northern Idaho, by making the necessary appropriations for collecting and feeding them.

In this connection, investigations have been made and are still in progress for the purpose of determining whether, if the proposed reservations are established, any change in the location of interior posts will be necessary or desirable.

The exploration of the country in the vicinity of the proposed Cour d'Alene reservation is not yet completed, but as soon as the command now engaged upon that work returns, a special report will be made.

Since the last annual report all the posts in the department have been inspected either by the department commander or by the inspector general, and found to be in a satisfactory condition, except that at some of them the provisions for sheltering the troops and protecting the public property are not so good as they should be; but in view of the limited appropriations and the probable temporary character of the interior posts, it has been considered inexpedient to authorize any expenditures for such purposes unless they were absolutely indispensable for health and comfort.

The most important of these were at Fort Vancouver, Fort Klamath, and Fort Lapwai, for repairs, barrack furniture, &c., required for their increased garrisons.

The troops are now well supplied and comfortably sheltered. Their health during the past year has been excellent, and the discipline, somewhat impaired by the reduction and reorganization of the Army, is now improving.

The estimates for the fiscal year were reduced as far as possible consistently with efficiency of service.

The expenditures have thus far been kept materially within the estimates, and there is no reason to apprehend that the same results will not be reached during the remainder of the year.

For details of the operations of the staff departments, reference is respectfully made to the reports transmitted herewith.

Very respectfully, your obedient servant,

ED. R. S. CANBY,
Brigadier General, Commanding.

ASSISTANT ADJUTANT GENERAL,
Military Division of the Pacific, San Francisco, California.

REPORT OF COLONEL CROOK.

HEADQUARTERS DEPARTMENT OF ARIZONA,
Camp Whipple, Arizona Territory, September 28, 1871.

SIR: I have the honor to report that when I assumed command of this department, June 4, 1871, all supplies were hauled across the Colorado Desert by two routes; one from Drum Barracks to Fort Mojave, two hundred and eighty-five miles, and the other from San Diego to Fort Yuma, two hundred miles.

Since July 1, the Colorado Transportation Company has been transporting our supplies and troops direct from San Francisco to Forts Yuma and Mojave, by water, with more dispatch, economy, and in much better condition than by the other routes.

I found the transportation in the department limited, and, with few exceptions, in bad condition; wagons falling to pieces by reason of shrinkage from the intense heat of the climate, and many mules unserviceable from want of proper care and knowledge. In this connection, I earnestly recommend that all rolling-stock for use in this department be constructed at Fort Yuma, out of material seasoned in that climate.

The quartermaster's supplies are of about the same quality as furnished the Army elsewhere. I wish to call attention to the fact, however, that the present clothing allowance for the soldier will not even keep him in shoes when in the field, and I earnestly recommend an extra issue.

The commissary supplies are ample and well selected, and, considering the ordeal they have to pass through *en route*, reflect much credit on the efficiency of the officers furnishing them.

The ordnance supplies are ample, with the exception of leather, of which much is needed for repairing. The saddles furnished are not adapted for service in this country; from excessive heat or other cause, the covering breaks at the cantle, and generally the consequent spreading of the saddle occasions serious injury to the horse's back. I would respectfully recommend that the saddle furnished in future be what is known as the "California Tree," made in the warm climate of Los Angeles. For some reason, ordnance and ordnance stores have not reached the department with the promptness desirable; requisitions forwarded six months since have not yet been filled, and much inconvenience is thereby occasioned.

The posts off the Colorado River are situated, as a general thing, on the borders of the country inhabited by the hostile Indians, are well selected for operating against them, and, with the exception of Camps Grant and Verde, which are reported sickly, are in healthy locations. The quarters generally are rude and uncomfortable, with some of the troops living in tents. Camp Apache, from its situation, should be supplied and paid from New Mexico. I abandoned Camp Pinal on account of its inaccessibility, and ordered the removal of the troops from San Diego and Drum Barracks, in order to concentrate and utilize their transportation.

Commencing with Cochise's band, which inhabits the country for about one hundred miles north of Camps Bowie and Crittenden, (and between them,) and extending into Mexico and New Mexico, we have the Pinals in the vicinity of Camp Grant, the Coyotereros, near Camp Apache, and the Tontos, extending to Camp McDowell, Fort Whipple, and Camp Verde; numbering in all not to exceed from five to seven hundred warriors, which is the entire sum up of the hostile Apaches in

this department. Although living in this country, they frequently depredate more than one hundred miles out of its limits.

Then, again, in the vicinity of Date Creek, we have the Apache Mojaves, who, though nominally at peace, are continually committing little acts of theft, with occasional murders. The Hualapais, to the north of this tribe, are now behaving well.

I think the Apache is painted in darker colors than he really deserves, and that his villainies arise more from a misconception of facts than from his being worse than other Indians. Living in a country the natural products of which will not support him, he has either to cultivate the soil or steal, and, as our vacillating policy satisfies him we are afraid of him, he chooses the latter, also as requiring less labor and being more congenial to his natural instincts. I am satisfied that a sharp, active campaign against him would not only make him one of the best Indians in the country, but it would also save millions of dollars to the Treasury, and the lives of many innocent whites and Indians.

On the 11th of July I left Tucson with parts of five troops of cavalry and a company of fifty Mexican scouts, to operate against Cochise, and, if unsuccessful, to march to Camp Apache, and form an alliance with the friendly Indians there. On arriving at Camp Apache, being entirely successful in this undertaking, I left Captain Henry, with three troops of cavalry, to be accompanied by some of these friendly Indians, as scouts, to operate against hostile Indians on his march to Camp McDowell. Captain Henry reported this combination of the Indian with the soldier to exceed his most sanguine expectations; that the Indians were invaluable, and enabled him to kill seven warriors and to take eleven women prisoners, under the most unfavorable circumstances. The great difficulty in operating against the Apaches is the inaccessibility and extent of his country. My intention was to put in the field at once five expeditions, constituted similarly to the one commanded by Captain Henry; but just as I was completing the last of these organizations, I learned that the settlement with the Indians had virtually been taken out of my hands, and turned over to the peace commissioners. I at once ordered the suspension of hostilities, for fear of interfering with their plans. Cochise's band has been particularly active in its depredations lately, and I think this is mainly due to the fact he is left foot-loose, while his families are being subsisted and protected on the Indian reservation at Cañada Alamosa, New Mexico.

Owing to the isolated condition of this department, and the scattered distribution of its posts, the construction of a telegraph-line from California to this country, with branches to some of the important posts, would not only be of great service, but would be economy to the Government.

The number of troops in this department is sufficient, provided all the cavalry were mounted; but, even now, at least one-third are dismounted. After furnishing escorts to the surveyors of the Atlantic and Pacific Railroad, and to Lieutenant Wheeler, the mounted force left here will be insufficient. In the absence of department records, I am unable to embody the transactions of the department under my predecessor, from the date of his last report up to that of my assuming command.

Very respectfully, your obedient servant,

GEORGE CROOK,

Lieutenant Colonel, Twenty-Third United States Infantry,

Bvt. Maj. Gen., U. S. A., Commanding Department.

ADJUTANT GENERAL, UNITED STATES ARMY,

Washington, D. C.

(Through Headquarters Military Division of the Pacific.)

REPORT OF COLONEL BARRY.

HEADQUARTERS ARTILLERY SCHOOL, UNITED STATES ARMY,
Fort Monroe, Virginia, September 12, 1871.

GENERAL: For the information of the General of the Army in the preparation of his annual report to Congress, I have the honor to make the following report of the progress, present condition, &c., of the Artillery School of the United States Army.

Under the organization prescribed by General Orders No. 99, from headquarters of the Army, series of 1867, the Artillery School commenced its duties April 1, 1868. The code of regulations and programme of instruction which at that time had been prepared by the staff of the school, and had been approved by the General of the Army, were faithfully enforced and followed out, and, at the conclusion of the year, of the class of twenty lieutenants of artillery who had been under instruction eighteen were thoroughly examined, and were returned to their respective regiments. With some minor modifications, the same course of instruction was pursued by the class of the following year, and at the termination of that scholastic year twenty more lieutenants who had been under instruction were examined in the most thorough manner, and were sent back to their regiments. The experience of these two years having, in my opinion, afforded sufficient information as to what, in view of the present faulty organization of the artillery of the Army and of the condition of the *personnel* of its officers, ought to be the established course of theoretical instruction at the school, the question was presented by me to the staff, who gave it careful consideration, and finally decided upon what seemed to be the most advantageous course and the most suitable text-books. Their decision received the approval of the General of the Army, and the course of theoretical instruction as thus established has been pursued since that date. The class of 1871 completed its course, was examined in April of that year, and sixteen officers, who were members of it, were sent back to their regiments; the other members of the class having left the service, either by resignation or muster-out, prior to the examination. The class of 1872, now under instruction, consists, as usual, of twenty lieutenants of artillery and of one of the aides-de-camp of the General of the Army, who, for reasons most creditable to himself, has, with the permission of the General, voluntarily joined the class.

It will thus be seen that fifty-four lieutenants of artillery have already received the full benefits of the school, and twenty more are now in progress of instruction. This constitutes nearly one-half of all of the officers of that grade now belonging to the artillery.

The course of *theoretical* instruction embraces the subjects of mathematics, ordnance and gunnery, military engineering and surveying, military history, and military constitutional and international law. The method of pursuing these studies is very similar to that pursued at the Military Academy at West Point, viz, by recitations, questions, and demonstrations at the black-board. In military history each officer is required, in addition to his regular recitations, to prepare and read before the class and staff of the school, two essays or memoirs upon some battle, campaign, or the military events of some epoch of peculiar interest. The topics for these essays are selected by the instructor in military history, with the approval of the commandant and superintendent.

ent of instruction, and are generally confined to events not prior to the last two decades of the eighteenth century. The necessary maps, instruments, and apparatus for the elucidation or practical application of the various subjects of the entire range of the theoretical course have, to considerable extent, been supplied to the school by requisition upon the Engineer and Ordnance Departments of the Army. They are kept in active use and are of the greatest value. Instruction in the theoretical course is confined to the months of autumn, winter, and the early spring, except instruction in mathematics, which unavoidably has to be given during the months of May, June, July, and August.

The course of *practical* instruction is pursued, as the weather permits, throughout the entire year, but is more closely attended to during the months of summer and autumn.

This course consists of the service of every species of gun, howitzer, or mortar in use in the United States military service; of the use of the various kinds of projectiles and fuses; the laying of platforms; the use of plane-tables and telemeter for ascertaining ranges; of mechanical maneuvers, transportation, and other handling of all kinds of ordnance, and particularly of the 15-inch guns and their carriages, and of 13-inch mortars and their beds, and other heavy material which has been adopted into the artillery of the United States. The practical course also includes very full target-practice with every description of ordnance; the duties of the laboratory, as far as they immediately concern officers of artillery; and the study of, and recitation in, the tactics for light and heavy artillery, and in so much of the tactics for infantry as is essential for artillery officers. Guns, carriages, ammunition, platforms, artillery machines, including hydraulic jacks of greater or less power, and other appliances, are supplied by requisition on the Ordnance Department in such number and variety as may be desired. The school is compelled to be indebted to the Ordnance Department for the occasional use, when necessary, of some of its instruments and apparatus for determining initial velocities, pressures, densities, &c.

Instruction in the *practical* course is designed to be as thorough as possible, and no officer leaves the school who has not become practically familiar with the tools of his trade and able to use them intelligently.

A school for non-commissioned officers, and for such other enlisted men as may desire to avail themselves of its advantages, is also established. Every non-commissioned officer belonging to the five instruction batteries is required to attend the school for one year's full course of instruction. All other enlisted men are permitted to attend, but their attendance upon school is entirely voluntarily. Enlisted men of good character, and belonging to batteries not stationed at the post where the Artillery School is established, are also permitted to enjoy the benefits of one year's course of instruction at the school. Such men, on their own application, are nominated by their battery commanders to their regimental commanders, on whose approval they are detached from their batteries by orders from headquarters of the Army, and directed to report themselves, in person, to the commanding officer of the school. Of this last-named class of men, twenty-two have undergone, or are now undergoing, instruction at the school. The course of instruction for the non-commissioned officers is both practical and theoretical. The practical course is pursued *pari-passu* with that of the commissioned officers, but is not carried to the same extent, being restricted to the scope of the necessary duties and requirements of non-commissioned officers of artillery and to the average capacity of enlisted men of that grade in our Army.

The theoretical course of instruction for the non-commissioned officers embraces mathematics, history of the United States, geography, reading, and writing. The subject of mathematics includes the entire field of arithmetic, and, for the more advanced scholars, it is carried as far as equations of the second degree in algebra. The instruction in most of the branches is conducted as in the school for commissioned officers, by recitations at the black-board and by questions. Since the commencement of the duties of the Artillery School, one hundred and three enlisted men (chiefly non-commissioned officers) have gone through the entire course of practical and theoretical instruction for one year, and have been awarded by the staff engraved certificates, signed by each of its members, setting forth that fact.

These men belong to the following regiments:

	Sergeants.	Corporals.	Privates, &c.
First Artillery.....	9	10	15
Second Artillery.....	9	8	6
Third Artillery.....	5	6	5
Fourth Artillery.....	5	7	2
Fifth Artillery.....	5	6	5

Since the first organization of the school, the *personnel* of its staff and instructors has undergone but few changes. Major William Hays, Fifth Artillery, was relieved May 1, 1869, by Major C. H. Morgan, Fourth Artillery. Major Morgan was relieved January 5, 1871, by Major G. A. De Russey, Third Artillery. Captains G. V. Henry, First Artillery, and E. B. Williston, Second Artillery, were relieved May 1, 1869, by Captains S. S. Elder, First Artillery, and S. N. Benjamin, Second Artillery; and Captain J. W. Piper, Fifth Artillery, reported for duty at same date. Captain J. B. Shinn, Third Artillery, was relieved July 31, 1869, by Captain E. R. Warner, Third Artillery. Captain J. B. Campbell, Fourth Artillery, was relieved December 31, 1870, by Captain Richard Loder, Fourth Artillery, the batteries of these two officers being exchanged at same date. First Lieutenant J. P. Sanger, First Artillery, adjutant and secretary of staff, was relieved November 3, 1870, by First Lieutenant J. C. Breckinridge, Second Artillery. The following-named officers constitute the staff and instructors at the school at the present date, and, with the above-stated exceptions, have been thus on duty since its first establishment:

Colonel William F. Barry, Second Artillery, commandant.

Lieutenant Colonel Joseph Roberts, Fourth Artillery, superintendent of theoretical instruction.

Major G. A. De Russey, Third Artillery, superintendent of practical instruction.

Major T. G. Baylor, Ordnance Corps, member of staff.

First Lieutenant J. C. Breckinridge, Second Artillery, adjutant of the school and secretary of staff.

Captain Richard Loder, Fourth Artillery, instructor in mathematics and ordnance and gunnery.

Captain S. S. Elder, First Artillery, instructor in military international and constitutional law and in tactics.

Captain S. N. Benjamin, Second Artillery, instructor in mathematics and military engineering.

Captain E. R. Warner, Third Artillery, instructor in mathematics and military history.

Captain J. W. Piper, Fifth Artillery, instructor in tactics and superintendent of non-commissioned officers' school.

The duties connected with the administration, superintendence, and instruction of the school, demand of all officers charged with these responsibilities at all times, and with little or no interval during the whole of each year, much industry, sound judgment, and energy, and so close an attention to routine duties as to involve the sacrifice of the greater part of their personal leisure. I am happy to be able to state that the officers who have performed the duties of superintendents and instructors have labored faithfully, zealously, and intelligently, and have thus co-operated with me most efficiently in the administration of the school and in the advancement of the important end sought to be attained by its establishment.

A library of reasonably well-selected professional works belongs to the school; and affords the officers connected with it opportunities for reference, reading, and professional improvement not to be otherwise obtained. Excepting the liberal bequest of Colonel Archer and donations of duplicates from the libraries of the War Department and of the Military Academy at West Point, (amounting in the case of Colonel Archer to about two hundred volumes, and in the other cases to about one hundred volumes,) the collection of books constituting the library of the Artillery School has been procured by purchase by the post fund of Fort Monroe, and at no expense to the National Treasury. During the administration of the undersigned, about six hundred volumes have been so purchased and added to the library, which now consists of two thousand and fifty volumes.

As a useful aid to the course of practical and theoretical instruction, and as a place of deposit for various military curiosities and trophies of the war of the rebellion, an artillery museum was commenced by the undersigned in 1869. Models of the field, siege, and portions of the sea-coast artillery system of the United States; specimens of many varieties of primers, fuses, and projectiles of the United States and of the late confederate service; specimens of the different varieties of small arms in use in this country from the commencement of the present century to the present date, and of several different varieties of the small arms of foreign countries; instruments for inspecting cannon and projectiles, constitute a portion of this collection, which at present numbers nearly four hundred different articles.

Since its organization, the Artillery School has imposed upon the United States no special pecuniary expense. With the exception of the comparatively trifling cost of the additional stationery, fuel, lights, and of ammunition, required for the purpose of instruction, the annual cost to the United States of the Artillery School is absolutely no more than that of any other military post of the same size. No special appropriations for the maintenance of the school are now needed and none are requested.

During the first two years of the existence of the Artillery School, it was but natural to expect that among officers who had arrived at mature life, and who had seen several years of service, a portion of which was active service in the field, there should be found some who were not well inclined to submit to the hard study and sacrifice of personal leisure which a tour of duty at the school demanded. There are now many evidences of the fact that these mists of prejudice are fast drifting away, and that the school is finding confidence and favor with the artillery at large. At all events, it can be said, with the utmost truthfulness, that,

with but very few exceptions, the officers of artillery who have been assigned to the school for instruction have appreciated the opportunities thereby afforded them.

I am, general, very respectfully, your obedient servant,
WILLIAM F. BARRY,
Colonel Second Artillery, Commanding.

General E. D. TOWNSEND,
Adjutant General, United States Army.

REPORT OF THE ADJUTANT GENERAL.

REPORT OF THE ADJUTANT GENERAL.

Report of the recruiting service from October 1, 1870, to October 1, 1871.

ADJUTANT GENERAL'S OFFICE, Washington, October 23, 1871.

Recruiting for cavalry, artillery, and infantry was actively carried on in the principal northern and western cities, except during a short interval in 1870, when the cavalry rendezvous in some of the western cities were closed.

The superintendency of the general recruiting service at Newport Barracks, Kentucky, has been merged with that at New York City, the depots for recruits remaining at Newport Barracks and Fort Columbus, New York Harbor, as heretofore.

The principal depot and superintendency for the mounted service was transferred in January, 1871, from Carlisle Barracks, Pennsylvania, to Saint Louis Depot, Missouri, a sub-depot being located at the former place until within the past few months. This sub-depot was broken up to avoid useless expense in maintaining it, as it was found the concentration of recruits could be effected as well without it.

On the Pacific coast the recruiting service for organizations in that section is conducted under the supervision of the commanding general, Military Division of the Pacific.

In March, 1871, with a view to reduce the Army to its legal strength of 30,000 men, by the 30th of June, 1871, the standard was raised so as to preclude the enlistment of white recruits, except those between the ages of twenty-one and thirty-five years, and of five feet six inches in height.

The standard of height has since been lowered to five feet five inches, in order to meet the increased demand for recruits to keep the companies full.

All the recruiting officers, except those on the Pacific coast, recruit also for the colored regiments.

E. D. TOWNSEND, *Adjutant General.*

Statement showing the number of enlistments and re-enlistments in the regular Army from September 20, 1870, to October 1, 1871; compiled from reports forwarded to this office by superintendents of the recruiting service, &c.

Regiments, &c.	Number enlisted and re-enlisted.	Regiments, &c.	Number enlisted and re-enlisted.	Regiments, &c.	Number enlisted and re-enlisted.
General service	6,594	1st Artillery	344	13th Infantry	74
Mounted service	2,371	2d Artillery	292	14th Infantry	79
Engineer battalion	99	3d Artillery	93	15th Infantry	33
Ordnance Department	297	4th Artillery	237	16th Infantry	259
Military Academy	37	5th Artillery	196	17th Infantry	27
Artillery School	4	1st Infantry	246	18th Infantry	65
Signal Corps	171	2d Infantry	137	19th Infantry	233
1st Cavalry	48	3d Infantry	81	20th Infantry	78
2d Cavalry	137	4th Infantry	86	21st Infantry	106
3d Cavalry	32	5th Infantry	118	22d Infantry	19
4th Cavalry	7	6th Infantry	172	23d Infantry	145
5th Cavalry	23	7th Infantry	81	24th Infantry	469
6th Cavalry	30	8th Infantry	122	25th Infantry	136
7th Cavalry	125	9th Infantry	142		
8th Cavalry	12	10th Infantry	37		
9th Cavalry	18	11th Infantry	39	Total	14,306
10th Cavalry		12th Infantry	155		

NOTE.—Of the recruits enlisted for general service, 307 were for colored infantry; and of those for mounted service, 150 were for colored cavalry.

E. D. TOWNSEND, *Adjutant General.*

ADJUTANT GENERAL'S OFFICE, Washington, October 20, 1871.

C.—Position and distribution of troops in the Military Division of the Missouri, commanded returns on file in the Adjutant

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General's Dept.	Inspector General.
DEPARTMENT OF DAKOTA.				Staff of division.	1	1	2	1	1
Headquarters.....	St. Paul, Minn.....	Maj. Gen. W. S. Hancock.....		Department staff.	1		2	1	
Fort Snelling, Minn.	About 5 miles below St. Paul.	Col. Geo. Sykes, 20th Inf.	1	20th Inf.....					•
Fort Ripley, Minn.	On the Mississippi River, 47 miles north of Sauk Rapids.	1st Lt. J. A. Manley, 20th Inf.	1	20th Inf.....					
Fort Wadsworth, D. T.	On Kettle Lake, 197 miles west of St. Cloud, Minn.	Capt. J. S. McNaught, 20th Inf.	2	20th Inf.....					
Fort Ransom, D. T.	On Cheyenne River, 245 miles N.W. of St. Cloud, Minn.	1st Lt. J. S. Stafford, 20th Inf.	1	20th Inf.....					
Fort Totten, D. T.	On S. E. shore of Devil's Lake.	Maj. J. E. Yard, 20th Inf.	2	20th Inf.....					
Fort Pembina, D. T.	Near Pembina, D. T.....	Capt. Lloyd Wheaton, 20th Inf.	2	20th Inf.....					
Fort Stevenson, D. T.	At junction of Douglas Creek with Missouri River.	Lt. Col. S. B. Hayman, 17th Inf.	2	17th Inf.....					
Fort Randall, D. T.	On the Missouri River, 146 miles above Sioux City, Iowa.	Lt. Col. E. S. Otis, 22d Inf.	4	22d Inf.....					
Fort Sully, D. T.	On the Missouri River, 315 miles above Sioux City, Iowa.	Col. D. S. Stanley, 22d Inf.	4	22d Inf.....					
Fort Rice, D. T.	On the Missouri River, 760 miles above Sioux City, Iowa.	Col. T. L. Crittenden, 17th Inf.	4	17th Inf.....					
Fort Buford, D. T.	On the Missouri River, near the mouth of the Yellowstone.	Lt. Col. C. C. Gilbert, 7th Inf.	3	7th Inf.....					
Fort Abercrombie, D. T.	On the Red River of the North, 170 miles N. W. of St. Cloud, Minn.	Lt. Col. L. C. Hunt, 20th Inf.	1	20th Inf.....					
Whetstone agency, D. T.		Capt. C. A. Webb, 22d Inf.	1	22d Inf.....					
Lower Brulé ag'cy, D. T.		Capt. John Hartley, 22d Inf.	1	22d Inf.....					
Cheyenne agency, D. T.		Capt. E. P. Pearson, jr., 17th Inf.	2	17th Inf.....					
Grand River ag'cy, D. T.		Capt. Henry Clayton, 17th Inf.	2	17th Inf.....					
Fort Shaw, M. T.	On the Sun River, 80 miles north of Helena.	Col. John Gibbons, 7th Inf.	4	7th Inf.....					
Fort Ellis, M. T.	3 miles from the town of Bozeman.	Maj. E. M. Baker, 2d Cav.	5	2d Cav. and 7th Inf.					
Fort Benton, M. T.	On the Missouri River, at head of navigation.	1st Lt. Wm. L. Reed, 7th Inf.	1	7th Inf.....					
Camp Baker, M. T.	110 miles N. W. of Fort Ellis.	Capt. G. L. Browning, 7th Inf.	1	7th Inf.....					
Total.....			44		1		2	1	
DEPARTMENT OF THE MISSOURI.									
Headquarters.....	Fort Leavenworth, Kans.	Brig. Gen. John Pope.....		Department staff.	1		2	1	1
Fort Leavenworth, Kans.	On the Missouri River, 3 miles above Leavenworth City.	Col. N. A. Miles, 5th Inf.	4	3d and 5th Inf.					

by Lieutenant General P. H. Sheridan, headquarters Chicago, Illinois; taken from the latest General's Office, 1871.

PRESENT.																ABSENT.						PRESENT AND ABSENT.							
Bureau of Military Justice. Quartermaster's Department. Subsistence Department. Medical Department. Pay Department. Corps of Engineers. Ordnance Department. Post chaplains. Military store-keepers. Colonels. Lieutenant colonels. Majors. Captains. Regimental chaplains. Regimental adjutants. Regimental quartermasters. Subalterns.																Enlisted men. Total commissioned. Aggregate. (General and staff officers. Field and reg't staff officers. Captains. Subalterns. Enlisted men. Total commissioned. Aggregate. Commissioned officers. Enlisted men. Aggregate.						Commissioned officers. Enlisted men. Aggregate.							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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1	2	3	4																										

C.—Position and distribution of troops in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	Number of companies.	GARRISONS.		PRE-ENT.	
				Regiments.	General officers.	Military secretary.	Adjutant General's Dept.	Inspectors gen. ral.
DEPARTMENT OF THE MISSOURI—Cont'd.							
Fort Riley, Kans...	On the line of the K. P. R. R.	Capt. A. R. Chaffee, 6th Cav.	1	6th Cav			
Fort Dodge, Kans...	80 miles S. W. of Hays City, nearest station on K. P. R. R.	Col. De L. Floyd Jones, 3d Inf.	3	6th Cav. and 3d Inf.			
Fort Harker, Kans...	On the line of the K. P. R. R.	Capt. Simon Snyder, 5th Inf.	1	5th Inf			
Fort Hays, Kans...	Half mile from Hays City.	Capt. Samuel Ovenshine, 5th Inf.	2	5th Inf			
Fort Larned, Kans...	73 miles from Fort Harker.	Capt. G. E. Head, 3d Inf.	2	3d Inf			
Fort Wallace, Kans...	On the line of the K. P. R. R.	Capt. Edmond Butler, 5th Inf.	3	5th Inf			
Camp near Fort Hays, Kans.		Col. James Oakes, 6th Cav.	6	6th Cav			
Southeastern Kansas.	Headquarters at Fort Scott, Kans.	Lt. Col. T. H. Neill, 6th Cav.	3	6th Cav. and 6th Inf.			
Fort Lyon, C. T.	On the Arkansas River, 132 miles S.W. of Sheridan, Kans.	Lt. Col. J. R. Brooke, 3d Inf.	3	3d Inf			
Fort Reynolds, C. T.	On the Arkansas River, 20 miles east of Pueblo, C. T.	Capt. H. B. Bristol, 5th Inf.	1	5th Inf			
Fort Garland, C. T.	On Utah Creek, 298 miles from Sheridan, Kans.	Capt. H. C. Bankhead, 8th Cav.	2	8th Cav. and 15th Inf.			
District of New Mexico.	Headquarters at Santa Fé, N. M.	Col. G. Granger, 15th Inf.		District staff & 15th Inf.			
Fort Union, N. M.	On the Moro River, 257 miles from Sheridan, Kans.	Col. J. I. Gregg, 8th Cav.	5	8th Cav. and 15th Inf.			
Fort Wingate, N. M.	On the Rio Puerco of the West, 28 miles west of Fort Union.	Maj. W. R. Price, 8th Cav.	4	8th Cav. and 15th Inf.			
Fort Craig, N. M.	On the Rio Grande, 260 miles from Fort Union.	Capt. F. W. Coleman, 15th Inf.	1	15th Inf			
Fort Stanton, N. M.	On the Rio Bonita, 207 miles from Fort Union.	Lt. Col. A. V. Kautz, 15th Inf.	2	8th Cav. and 15th Inf.			
Fort McRae, N. M.	On the Ojo del Muerto, 292 miles from Fort Union.	Capt. Geo. Shorkley, 15th Inf.	1	15th Inf			
Fort Bayard, N. M.	Near Pinos Altos, 480 miles from Fort Union.	Capt. E. W. Whittemore, 15th Inf.	4	8th Cav. and 15th Inf.			
Fort Cummings, N. M.	At Cook's Springs, 403 miles from Fort Union.	Capt. Alfred Hedberg, 15th Inf.	1	15th Inf			
Fort Selden, N. M.	On the Rio Grande, 350 miles from Fort Union.	Lt. Col. T. C. Devin, 8th Cav.	2	8th Cav			
Fort Gibson, I. T.	On the Neosho River, 110 miles from Baxter's Springs.	Col. Wm. B. Hazen, 6th Inf.	5	6th Inf			
Fort Sill, I. T.	At the junction of Medicine Bluffs and Cache Creeks.	Col. B. H. Grierson, 10th Cav.	10	10th Cav			
Camp Supply, I. T.	181 miles south of Hays City, Kans.	Lt. Col. J. W. Davidson, 10th Cav.	8	6th and 10th Cav. and 3d and 6th Inf.			
Little Rock, Ark...		Capt. H. S. Hawkins, 6th Inf.	1	6th Inf			
St. Louis Depot, Mo.		Col. Edward Hatch, 9th Cav.		Recruiting Depot.			
Total			75				1 2 1 1

Military Division of the Missouri, &c.—Continued.

PRESENT.																			ABSENT.							PRESENT AND ABSENT.				
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'tl staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
1	1						1					1				1	65	4	69								4	65	69	
	1							1				3	1	1		5	212	12	224	1	1			1	2	3	14	213	227	
	1						1					1				2	60	5	65								5	60	65	
1	1						1					2				4	99	9	108					1	1	1	9	100	109	
	1						1					2				3	93	7	100				1		1	1	8	93	101	
	1											3				3	122	7	129	1		2		2	3	5	10	124	134	
	1							1		3		5	1	1		8	45	20	472		1	4			5	5	25	452	477	
									1			2				5	171	8	179		1				1	1	2	9	172	181
	1						1		1			3				3	121	9	130				1		1	1	10	121	131	
												1				1	44	2	46				1		1	1	3	44	47	
	1											1				4	100	6	106								6	100	106	
1	2	1	3					1	1				1	1			25	11	36	1					1	1	12	25	37	
	1						1	1				3			1	8	373	15	388	2	2	1			5	5	10	20	378	396
1	1									1		3				7	236	13	249		1				1	1	14	236	250	
												1				1	61	2	63			1			1	1	3	61	64	
	1							1				2				3	132	7	139			1			1	1	8	132	140	
												1				2	53	3	56								3	53	56	
												4				6	254	10	264			2			1	2	3	12	255	267
												1				2	56	3	61								3	56	61	
								1				2				3	151	6	157			1			13	1	14	7	164	171
	1							1	1	1		4	1	1		9	261	19	280		2	1			1	3	4	22	262	284
1	1							1		1		9	1	1	1	13	759	29	788	1	1	3			2	5	7	34	761	795
1	1									1		7				6	471	18	489		1	8			4	9	13	27	475	502
												1				1	61	2	63			1			1	1	3	61	64	
1								1									412	2	414								2	412	414	
1	9	419	9	1			6	2	8	6	7	64	1	6	7	109	5,094	262	5,356	1	6	11	30		31	48	79	310	5,125	5,435

C.—Position and distribution of troops in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Military secretary.	Aide-de-camp.	Adjutant General's Dept.	Inspector General.
DEPARTMENT OF THE PLATTE.									
Headquarters.....	Omaha, Nebr.....	Brig. Gen. C. C. Augur....		Department staff.	1	3	1		
Omaha Barracks, Nebr.	4 miles above Omaha....	Col. I. N. Palmer, 2d Cav.	8	2d Cav. and 9th Inf.					
Fort McPherson, Nebr.	7 miles south of McPherson Station, on U. P. R. R.	Col. W. H. Emory, 5th Cav.	6	5th Cav.....					
Sidney Barracks, Nebr.	½ mile from Sidney Station, on U. P. R. R.	Lt. Col. Thomas Duncan, 5th Cav.	2	5th Cav. and 14th Inf.					
Fort D. A. Russell, W. T.	Near Cheyenne City, on U. P. R. R.	Col. J. H. King, 9th Inf..	10	5th Cav., 9th and 14th Inf.					
Fort Laramie, W. T.	90 miles north of Cheyenne City.	Col. J. E. Smith, 14th Inf.	5	5th Cav. and 14th Inf.					
Fort Fetterman, W. T.	170 miles north of Cheyenne City.	Lt. Col. J. E. Woodward, 14th Inf.	4	14th Inf.....					
Fort Sanders, W. T.	On the line of the U. P. R. R.	Lt. Col. L. P. Bradley, 9th Inf.	2	2d Cav. and 9th Inf.					
Fort Fred. Steele, W. T.	At the point where the U. P. R. R. crosses North Platte River.	Lt. Col. H. A. Morrow, 13th Inf.	3	2d Cav. and 13th Inf.					
Fort Bridger, W. T.	10 miles south of Carter's Station, on U. P. R. R.	Maj. R. S. La Motte, 13th Inf.	2	13th Inf.....					
Camp Stambaugh, W. T.	115 miles northeast of Bryan Station, on U. P. R. R.	Maj. J. S. Brisbin, 2d Cav.	2	2d Cav. and 13th Inf.					
Camp Brown, W. T.	In Wind River Valley ..	Capt. R. A. Torrey, 13th Inf.	1	13th Inf.....					
Camp Douglas, U. T.	3 miles east of Salt Lake City.	Col. P. R. de Trobriand, 13th Inf.	5	2d Cav. and 13th Inf.					
Total			50		1	3	1		
Grand total	Military Division of the	Missouri	169		4	1	9	4	2

ADJUTANT GENERAL'S OFFICE, Washington, D. C., October 20, 1871.

Military Division of the Missouri, &c.—Continued.

PRESENT.																	ABSENT.						PRESENT AND ABSENT.							
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplain.	Military store-keepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg't staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
1	4	1	1	4	1	2			1	1	2	7	1	1	10		10	16	26								16	10	26	
			2						1	1		7	1	1	10		525	25	550		1	3		37	4	41	29	562	591	
		1							1	1		5	1	1	10		393	20	413		2	1	3		4	6	10	26	397	423
			1						1			2			3		96	7	103				1		3	1	4	8	99	107
		1							1		2	8	1	1	17		569	31	600	1		2	2		7	5	12	36	576	612
		1							1			5	1	1	6		251	15	266				3		7	3	10	18	258	276
									1			4			5		215	11	226				1		4	1	5	12	219	231
		1							1			2			4		96	10	106						1		1	10	97	107
		1							1			2			4		164	9	173			1	2		2	3	5	12	166	178
									1			2			4		78	8	86						2		2	8	80	88
									1			1			3		99	5	104			1	1			2	2	7	99	106
												1			1		60	2	62								2	60	62	
												5	1	1	8		216	18	234						4		4	18	220	238
1	4	1	12	4	1	2	3	1	5	5	7	44		5	5	75	2,772	177	2,949	1	2	6	16		71	25	96	202	2,843	3,045
321	947	19	3	2	13	4	17	15	18	138	1	14	16	251	10	143	602	10,745	3	10	30	65		213	108	321	710	10,356	11,066	

E. D. TOWNSEND, *Adjutant General.*

D.—Position and distribution of troops in the Military Division of the South, commanded by returns on file in the Adjutant

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	Number of companies.	GARRISONS.	PRESENT.			
				Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General's Dept.
DEPARTMENT OF THE SOUTH.				Staff of division.	1	3	1	1
Headquarters.....	Louisville, Ky.....	Brig. Gen. A. H. Terry.....		Department staff.	1	3	1	1
Charleston, S. C.....		Col. G. W. Getty, 3d Art.	2	3d Art.....				
Columbia, S. C.....		Lt. Col. H. M. Black, 18th Inf.	6	7th Cav. and 18th Inf.				
Yorkville, S. C.....		Maj. Lewis Merrill, 7th Cav.	2	7th Cav. and 18th Inf.				
Spartanburgh, S. C.....		Maj. M. A. Reuo, 7th Cav.	2	7th Cav. and 2d Inf.				
Chester, S. C.....		Capt. W. H. McLaughlin, 18th Inf.	1	18th Inf.....				
Newberry, S. C.....		Capt. Jas. Stewart, 18th Inf.	1	18th Inf.....				
Unionville, S. C.....		Capt. Wm. Thompson, 7th Cav.	1	7th Cav.....				
Sumter, S. C.....		Capt. T. J. Lloyd, 18th Inf.	1	18th Inf.....				
Atlanta, Ga.....		Maj. P. T. Swaine, 2d Inf.	6	2d Cav., 2d and 18th Inf.				
Savannah, Ga.....		Capt. L. R. L. Livingston, 3d Art.	1	3d Art.....				
Fort Pulaski, Ga.....		Maj. R. V. W. Howard, 3d Art.	2	3d Art.....				
Fort Jefferson, Fla.....	At the Garden Key, Tortugas.	Lt. Col. R. B. Ayres, 3d Art.	3	3d Art.....				
Fort Barrancas, Fla.....	In Pensacola Harbor.....	1st Lt. J. L. Tiernon, 3d Art.	1	3d Art.....				
St. Augustine, Fla.....		Capt. C. R. Layton, 16th Inf.	3	2d and 16th Inf.				
Huntsville, Ala.....		Col. S. W. Crawford, 2d Inf.	1	2d Inf.....				
Mobile, Ala.....		Capt. A. W. Kroutinger, 2d Inf.	2	2d Inf.....				
Jackson, Miss.....		Lt. Col. Jas. Van Voast, 16th Inf.	2	16th Inf.....				
Key West, Fla.....		1st Lt. Constantine Chase, 3d Art.	2	3d Art.....				
Aberdeen, Miss.....		Capt. S. Sturgeon, 6th Cav.	2	6th Cav. and 16th Inf.				
Meridian, Miss.....		Capt. W. H. Bartholomew, 16th Inf.	1	16th Inf.....				
Nashville, Tenn.....		Colonel G. Pennypacker, 16th Inf.	3	7th Cav. and 16th Inf.				
Humboldt, Tenn.....		Captain H. A. Theaker, 16th Inf.	1	16th Inf.....				
Chattanooga, Tenn.....		Capt. H. C. Cook, 2d Inf.	2	2d Inf.....				
Louisville, Ky.....		Col. S. D. Sturgis, 7th Cav.	4	4th Cav., 4th and 16th Inf.				
Lebanon, Ky.....		Lt. Col. J. H. Potter, 4th Inf.	2	4th Inf.....				
Shelbyville, Ky.....		Capt. M. W. Keogh, 7th Cav.	1	7th Cav.....				
Mount Vernon, Ky.....		Maj. J. G. Tilford, 7th Cav.	1	7th Cav.....				
Elizabethtown, Ky.....		Lt. Col. G. A. Custer, 7th Cav.	2	7th Cav. and 4th Inf.				
Frankfort, Ky.....		Col. F. F. Flint, 4th Inf.	2	4th Inf.....				
Paducah, Ky.....		Capt. John Rziha, 4th Inf.	1	4th Inf.....				

Major General H. W. Halleck, headquarters Louisville, Kentucky; taken from the latest General's Office, 1871.

PRESENT.																	ABSENT.							PRESENT AND ABSENT.						
Bureau of Military Justice.	Quartermaster's Department.	Signal Service Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'tl staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
1	1				1												10	5	15									5	10	15
1	2	1	1	4				1									11	12	23									12	11	23
			1						1			1	1	1	5		152	10	162			2	1	2	4	3	7	13	156	169
			1					1	1			5	1	1	9		380	19	408			2	1	2	2	5	7	24	391	415
											1	2			4		100	7	107						2		2	7	102	109
											1	1			3		99	5	104			1			3	1	4	6	102	108
												1			1		53	2	55			1			1	1	2	3	54	57
												1			2		53	3	56									3	53	56
												1			2		58	3	61						1		1	3	59	62
												1			2		51	3	54									3	51	54
			1								1	3			9		319	14	333			3	3		3	6	9	20	323	342
			1									1			2		47	4	51			1			1	1	1	5	47	52
											1	1			6		76	8	84			1	1			2	2	10	76	86
			1								1	1			5		120	8	128			2	6		2	8	10	16	122	138
												2			2		50	2	52			1	1			2	2	4	50	54
			1									3			6		148	10	158						5		5	10	153	163
			1									1	1	1	2		76	7	83								7	76	83	
			1									2			3		94	6	100			1	1			2	2	8	94	102
			1									1			4		88	7	95						2		2	7	90	97
												3			3		90	3	93			2	3			5	5	8	90	98
												2			2		110	4	114			2			5	2	7	6	115	121
												1			1		51	2	53			1			3	1	4	3	54	57
			1									3	1	1	4		180	12	192			1			2	1	3	13	182	195
												1			2		21	3	24						19		19	3	40	43
			1									1			4		92	6	98			1			1	1	2	7	93	100
			1									4	1	1	7		257	16	273			1			2	1	3	17	259	276
												2			3		106	6	112									6	106	112
												1			1		56	2	58			1			4	1	5	3	60	63
												1			1		40	3	43			1			1		1	4	40	44
			1									1			3		104	6	110			1	1			2	2	8	104	112
			1									2	1		4		120	9	129			1			2	1	3	10	122	132
												1			2		51	3	54						2		2	3	53	56

D.—Position and distribution of troops in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	GARRISONS.		PRESENT.				
			Number of companies.	Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General's Dept.	Inspectors General.
DEPARTMENT OF THE SOUTH—Cont'd.									
Lexington, Ky.....		Maj. Alexander Chambers, 4th Inf.	1	4th Inf.....					
Mount Sterling, Ky.....		Capt. C. J. Von Herman, 4th Inf.	1	4th Inf.....					
Newport Barracks, Ky.....	At Newport, Ky.....	Maj. H. G. Gibson, 3d Art.		Recruiting depot.					
Total.....			63			1	3	1	
DEPARTMENT OF TEXAS.									
Headquarters.....	San Antonio, Tex.....	Col. J. J. Reynolds, 3d Cav.		Department staff.				1	1
Austin, Tex.....		Capt. E. E. Sellers, 10th Inf.	1	10th Inf.....					
San Antonio, Tex.....		Lt. Col. J. H. Carleton, 4th Cav.	2	4th Cav. and 10th Inf.					
Fort Bliss, Tex.....	On the Rio Grande, four miles below Franklin.	Capt. C. Bentzoni, 25th Inf.	2	9th Cav. and 25th Inf.					
Fort Brown, Tex.....	On the Rio Grande at Brownsville.	Lt. Col. A. McD. McCook, 10th Inf.	4	10th Inf.....					
Fort Clark, Tex.....	On the Las Moras River, 126 miles west of San Antonio.	Col. G. L. Andrews, 25th Inf.	6	9th Cav. and 25th Inf.					
Fort Concho, Tex.....	At the junction of the Main and North Conchos.	Maj. J. P. Hatch, 4th Cav.	6	4th and 9th Cav. and 11th Inf.					
Fort Davis, Tex.....	On the Limpia River, 466 miles northwest of San Antonio.	Lt. Col. W. R. Shafter, 24th Inf.	3	9th Cav., 24th and 25th Inf.					
Fort Duncan, Tex.....	On the Rio Grande, at Eagle Pass.	Maj. Z. R. Bliss, 25th Inf.	4	9th Cav., 24th and 25th Inf.					
Fort Griffin, Tex.....	On the Clear Fork of Brazos River, at Marwell's Ranch.	Col. Wm. H. Wood, 11th Inf.	7	4th and 9th Cav. and 11th Inf.					
Fort McIntosh, Tex.....	On the Rio Grande, at Laredo.	1st Lieut. C. E. Jewett, 10th Inf.	1	10th Inf.....					
Ft. McKavett, Tex.....	On San Saba River, two miles from its source.	Col. Abner Doubleday, 24th Inf.	8	8th Cav. and 24th Inf.					
Fort Quitman, Tex.....	On the Rio Grande, 80 miles below Franklin.	Maj. A. P. Morrow, 9th Cav.	2	9th Cav. and 24th Inf.					
Ft. Richardson, Tex.....	Adjoining the town of Jacksborough.	Col. R. S. MacKenzie, 4th Cav.	11	4th Cav. and 11th Inf.					
Fort Stockton, Tex.....	At Comanche Springs, 84 miles from old Fort Lancaster.	Maj. J. F. Wade, 9th Cav.	4	9th Cav., 24th and 25th Inf.					
Ringgold Barracks, Tex.....	At Rio Grande City.....	Major T. M. Anderson, 10th Inf.	3	10th Inf.....					
Baton Rouge, La.....		Col. C. H. Smith, 19th Inf.	6	19th Inf.....					
Jackson Barracks, La.....	At New Orleans, La.....	Lt. Col. Alfred Sally, 19th Inf.	4	19th Inf.....					
Total.....			74					1	1
Grand total	Military Division of the South.....		137			2	7	2	1

ADJUTANT GENERAL'S OFFICE, Washington, D. C., October 20, 1871.

Military Division of the South, &c.—Continued.

PRESENT.																	ABSENT.						PRESENT AND ABSENT.								
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'tl staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.		
			1							1			1			2	51	3	54		1				1		1	4	51	55	
													1			2	41	3	44						3		3	3	44	47	
										1							424	2	426						10		10	2	434	436	
1	2	1	16	4					2	5	5	9	47		6	5	108	3,778	213	3,991		3	14	31		78	48	126	261	3,856	4,117
																	12	17	29									17	12	29	
													1			1	53	2	55			1			1		1	3	53	56	
													1			4	100	6	106			1			1		1	7	100	107	
													1			4	120	5	125			1			1		1	6	120	126	
	1					1			1			2	1		1	5	106	11	177		2	2	2	22	6	28	17	188	205		
							1	1				4	1	1	1	8	362	17	379			2	1	3	3	6	20	365	385		
				1								1	4			5	357	12	369			2	6		2	8	10	20	359	379	
		1										3				5	168	11	179									11	168	179	
			1									1	4			4	227	10	237	1			2		3		3	13	227	240	
	1		2						1	1	5		1	1		9	423	21	444		1	2	4		5	7	12	28	428	456	
																2	47	2	49			1			1			3	47	50	
		1							1			4	1	1	1	8	542	18	560			4	4		8	8	26	542	568		
	1											1				3	135	6	141		1	1			2		2	8	135	143	
			2					1	2	9		1		1		12	472	27	499	1	1	2	8	2	12	14	39	474	513		
			1									1	3	1	1	6	245	14	259		2	1	1		4	4	18	245	263		
												1	2			4	144	7	151			1	2		3	3	10	144	154		
			1									4	1			9	354	16	370		2	2	3		1	7	8	23	355	378	
												4				5	224	10	234	1			2		1	3	4	13	225	238	
1	6	1	11	7		1	2	2	6	5	9	52	3	7	4	94	4,151	212	4,363	3	8	22	37		36	70	106	282	4,187	4,469	
2	9	3	27	11		2	2	4	11	10	18	99	3	13	9	202	7,939	430	8,369	3	11	36	68		114	118	232	548	8,033	8,601	

R. D. TOWNSEND, Adjutant General.

E.—Position and distribution of troops in the Military Division of the Atlantic, commanded by latest returns on file in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	Number of companies.	GARRISONS.	PRESENT.				
				Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General's Dept.	Inspectors general.
DEPARTMENT OF THE EAST.				Staff of division.	1		3	1	1
Headquarters	New York City, N. Y.	Brig. Gen. Irwin McDowell.		Department staff.	1		1	1	
Fort Hamilton, N. Y. Harbor.	In New York Harbor.	Col. Israel Vogdes, 1st Art.	4	1st Art.					
Fort Wadsworth, N. Y. Harbor.	In New York Harbor.	Maj. J. M. Brannan, 1st Art.	1	1st Art.					
Willet's Point, N. Y. Harbor.	In New York Harbor.	Maj. H. L. Abbot, Corps of Engineers.	4	Engin'r Battalion.					
David's Island, N. Y. Harbor.	In New York Harbor.	Col. J. V. Bomford, 8th Inf.	10	8th Inf.					
Fort Columbus, N. Y. Harbor.	In New York Harbor.	Maj. M. M. Blunt, 14th Inf.		Recruiting Depot.					
Fort Wood, N. Y. Harbor.	In New York Harbor.	Maj. John Hamilton, 1st Art.	2	1st Art.					
Plattsburgh Barracks, N. Y.	At Plattsburgh, N. Y.	Capt. Richard Arnold, 5th Art.	2	1st and 5th Art.					
Fort Warren, Mass.	In Boston Harbor	Capt. J. B. Rawles, 5th Art.	1	5th Art.					
Fort Independence, Mass.	In Boston Harbor	Maj. Wm. Hays, 5th Art.	1	5th Art.					
Fort Preble, Me.	On Spring Point, Cape Elizabeth.	Maj. Truman Seymour, 5th Art.	1	5th Art.					
Fort Sullivan, Me.	At Eastport, Me.	Maj. G. P. Andrews, 5th Art.	1	5th Art.					
Fort Trumbull, Conn.	At New London, Conn.	Capt. G. A. Kenseel, 5th Art.	2	5th Art.					
Fort Adams, R. I.	In Newport Harbor	Col. H. J. Hunt, 5th Art.	4	5th Art.					
Fort McHenry, Md.	At Baltimore, Md.	Col. Horace Brooks, 4th Art.	4	4th Art.					
Fort Washington, Md.	On the Potomac River, 15 miles below Washington City.	Maj. A. P. Howe, 4th Art.	1	4th Art.					
Fort Foote, Md.	On the Potomac River, 8 miles below Washington City.	Capt. J. B. Campbell, 4th Art.	1	4th Art.					
Fort Monroe, Va.	At Old Point Comfort, Va.	Col. W. F. Barry, 2d Art.	5	1st, 2d, 3d, 4th, & 5th Art.					
Raleigh, N. C. ....	.....	Maj. C. H. Morgan, 4th Art.	1	4th Art.					
Rutherfordton, N. C.	.....	Capt. V. K. Hart, 7th Cav.	1	7th Cav.					
Fort Johnston, N. C.	At Smithville, N. C.	Capt. John Mendenhall, 4th Art.	1	4th Art.					
Fort Macon, N. C.	On Bogue Island, Beaufort Harbor.	Maj. Joseph Stewart, 4th Art.	2	4th Art.					
Charlotte, N. C. ....	.....	Capt. Evan Thomas, 4th Art.	1	4th Art.					
Total .....	.....	.....	50		1		1	1	
DEPARTMENT OF THE LAKES.									
Headquarters	Detroit, Mich.	Brig. Gen. P. St. George Cooke.		Department staff.	1		2	1	
Fort Wayne, Mich.	3 miles below Detroit.	Lt. Col. P. Lugenebeel, 1st Inf.	3	1st Inf.					
Fort Brady, Mich.	At Sault Ste. Marie, Mich.	Capt. I. D. De Russy, 1st Inf.	2	1st Inf.					

Major General George G. Meade, headquarters Philadelphia, Pennsylvania; taken from the Adjutant General's Office, 1871.

PRESENT.																	ABSENT.							PRESENT AND ABSENT.						
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'l staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
3	1	1					1										9	9	18									9	9	18
4	2	5					2										10	17	27	2					2	2	19	10	29	
		2						1			3		1	1		12	251	20	271	1	1	1			3	3	23	251	274	
			1								1	1				3	50	6	56								6	50	56	
			1	10													206	11	217	2				6	2	8	13	212	225	
		2						1	1		9		1	1		17	466	33	499		1	2		1	3	4	36	467	503	
		1									1						390	2	392	1				2	1	3	3	392	395	
		1									1	2				4	96	8	104				2		2	2	10	96	106	
		1										2				5	97	8	105					2			2	8	99	107
		1										1				3	48	6	54								6	48	54	
		1									1	1				3	46	6	52				1		1	1	7	46	53	
		1									1	1				2	31	5	36				1		1	1	6	31	37	
		1									1	1				3	47	6	53								6	47	53	
		1									2					2	74	5	79				2		2	2	7	74	81	
1	1							1			3		1	1		12	211	21	232		1		6	1	7	22	217	239		
		2						1			3		1	1		10	252	18	270		1	4	2	5	7	23	254	277		
		1									1	1				2	44	5	49					2	1	3	6	46	52	
											1					2	56	3	59				1		1	1	4	56	60	
1	2						1		1	1	1	5				20	283	32	315								32	283	315	
		1									1	1				1	42	4	46			2			2	2	6	42	48	
												1				1	53	2	55			1	7	1	8	3	60	63		
		1										1				1	32	3	35			2	1	2	3	5	33	38		
											1	1				3	109	5	114		1	2		3	3	8	109	117		
												1				2	41	3	44			1			1	1	4	41	45	
6	2	24	5	10		2	2	5	2	11	41		4	4		109	2,935	229	3,164	5	1	5	23	29	34	63	263	2,964	3,227	
2	1	2	3														9	10	19								10	9	19	
		1					1			1		3		1	1	5	170	13	183		2				2	2	15	170	185	
		1									2					2	80	5	85			2			2	2	7	80	87	

E.—Position and distribution of troops in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	GARRISONS.		PRESENT.			
			Number of companies.	Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General & Dep't. Inspectors general.
DEPARTMENT OF THE LAKES—Cont'd.								
Fort Gratiot, Mich.	On the St. Clair River, near outlet of Lake Huron.	Capt. T. M. Tolman, 1st Inf.	1	1st Inf				
Fort Mackinac, Mich.	On Michilimackinac Island.	Capt. Leslie Smith, 1st Inf.	1	1st Inf				
Fort Porter, N. Y.	At Buffalo, N. Y.	Capt. R. E. Johnston, 1st Inf.	2	1st Inf				
Fort Niagara, N. Y.	At Youngstown, N. Y.	1st Lt. J. L. Sherman, 1st Art.	1	1st Art				
Fort Ontario, N. Y.	At Oswego, N. Y.	Capt. Wm. Silvey, 1st Art.	1	1st Art				
Madison Barracks, N. Y.	Sacket's Harbor, N. Y.	Maj. C. L. Best, 1st Art.	2	1st Art. and 1st Inf.				
Total			13		1	2	1	
Grand total Military Division of the Atlantic			63		3	6	3	1

ADJUTANT GENERAL'S OFFICE, Washington, D. C., October 20, 1871.

Military Division of the Atlantic, &c.—Continued.

PRESENT.																ABSENT.								PRESENT AND ABSENT.						
Bureau of Military Justice, Quartermaster's Department, Subsistence Department, Medical Department, Pay Department, Corps of Engineers, Ordnance Department, Post chaplains, Military storekeepers, Colonels, Lieutenant colonels, Majors, Captains, Regimental chaplains, Regimental adjutants, Regimental quartermasters, Subalterns.																Enlisted men, Total commissioned, Aggregate, General and staff officers, Field and reg'tl staff officers, Captains, Subalterns, Enlisted men, Total commissioned, Aggregate, Commissioned officers, Enlisted men, Aggregate.														
1												1				2	56	4	60						1		1	4	57	61
			1									1				2	49	4	53						1		1	4	50	54
			1									2				4	106	7	113						1		1	7	107	114
			1													2	43	3	46		1	1	1	1	2	3	5	44	49	
			1									1				2	48	4	52				1		1	1	5	48	53	
			1								1					4	92	6	98				2	1	3	3	6	9	95	104
2	1	10	3				1			1	1	10			1	23	653	56	709		2	3	5	7	10	17	66	660	726	
11	435	8	10	1	3	2	5	5	3	12	51			5	5	132	3,597	294	3,891	5	3	8	28	36	44	80	338	3,633	3,971	

E. D. TOWNSEND, *Adjutant General.*

F.—Position and distribution of troops in the Military Division of the Pacific, commanded latest returns on file in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	Number of companies.	GARRISONS.	PRESENT.			
				Regiments.	General officers.	Military secretary.	Aides-de-camp.	Adjutant General's Dept.	Inspectors General.
DEPARTMENT OF CALIFORNIA.				Staff of division.	1	3	1	1
Headquarters.....	San Francisco, Cal.....	Brig. Gen. E. O. C. Ord....		Department staff.	1	2	1	
Presidio, Cal.....	3 miles west of San Francisco, Cal.	Lt. Col. W. H. French, 2d Art.	3	2d Art.....				
Point San José, Cal.	In San Francisco Harbor.	Capt. J. I. Rodgers, 2d Art.	1	2d Art.....				
Alcatraz Island, Cal.	In San Francisco Harbor.	Capt. J. M. Robertson, 2d Art.	2	2d Art.....				
Angel Island, Cal..	In San Francisco Harbor.	Col. O. B. Willcox, 12th Inf.	1	12th Inf.....				
Benicia Barracks, Cal.	At Benicia	Col. A. C. Gillem, 1st Cav.		H'dqrs. 1st Cav.				
Camp Independence, Cal.	In Owen's River Valley.	Capt. H. C. Egbert, 12th Inf.	1	12th Inf.....				
Camp Wright, Cal.	In Round Valley, 203 miles north of San Francisco.	Capt. F. C. Woodruff, 12th Inf.	1	12th Inf.....				
Camp Gaston, Cal..	On Trinity River near its junction with the Klamath River.	Lt. Col. A. D. Nelson, 21st Inf.	2	12th Inf.....				
Camp Bidwell, Cal.	215 miles north of Reno, Nev., nearest station on C. P. R. R.	Capt. R. F. Bernard, 1st Cav.	1	1st Cav.....				
Yerba Buena Island, Cal.	In San Francisco Harbor.	Capt. G. T. Olmstead, 2d Art.	1	2d Art.....				
Camp McDermitt, Nev.	80 miles north of Winnemucca Station, on C. P. R. R.	Capt. Henry Wagner, 1st Cav.	1	1st Cav.....				
Camp Halleck, Nev.	12 miles south of Halleck Station, on C. P. R. R.	Capt. James Biddle, 1st Cav.	2	1st Cav. and 12th Inf.				
Total			16		1	2	1	
DEPARTMENT OF THE COLUMBIA.								
Headquarters.....	Portland, Oreg	Brig. Gen. E. R. S. Canby....		Department staff.	1	2	1	
Fort Stevens, Oreg.	About 9 miles from Astoria.	Capt. A. C. M. Pennington, 2d Art.	1	2d Art.....				
Fort Klamath, Oreg.	Near Lake Klamath.....	Capt. James Jackson, 1st Cav.	2	1st Cav. and 23d Inf.				
Camp Warner, Oreg.	At the head of Christmas Lake.	Maj. Elmer Otis, 1st Cav.	2	1st Cav. and 23d Inf.				
Camp Harney, Oreg.	On Rattlesnake Creek, 6 miles south of Cañon City.	Maj. G. G. Hunt, 1st Cav.	2	1st Cav. and 23d Inf.				
Fort Vancouver, W. T.	On the Columbia River, 18 miles north of Portland, Oreg.	Maj. A. J. Dallas, 23d Inf.	3	23d Inf.....				
Fort Colville, W. T.	On the Columbia River, in Colville Valley.	Capt. Charles Wheaton, 23d Inf.	1	23d Inf.....				
Cape Disappointment, W. T.	At the mouth of Columbia River.	1st Lt. J. C. Scantling, 2d Art.	1	2d Art.....				
San Juan Island, W. T.	In Archipelago de Haro.	Capt. J. T. Haskell, 23d Inf.	1	23d Inf.....				
Fort Lapwai, I. T..	Near the junction of the Snake and Clear Water Rivers.	Capt. G. K. Brady, 23d Inf.	2	1st Cav. and 23d Inf.				

by Major General J. M. Schofield, headquarters San Francisco, California; taken from the Adjutant General's Office, 1871.

PRESENT.																	ABSENT.							PRESENT AND ABSENT.						
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'tl staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
2	2	2	1	1	1	1	1	2	1	1	2	1	1	1	1	1	10	14	24	1	1	1	1	1	2	7	9	14	10	24
2	1	1	4	1	1	1	1	1	1	1	2	1	1	1	1	1	16	10	26	1	1	5	2	7	9	22	10	10	20	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	242	15	257	1	1	5	2	7	9	22	244	266		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	4	48	1	1	2	2	2	2	6	44	50		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	106	9	115	1	1	2	2	2	2	9	106	115		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	88	8	96	1	1	2	2	2	2	8	88	96		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	4	26	1	1	2	2	2	2	5	22	27		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	46	4	50	1	1	2	2	2	2	4	46	50		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	49	3	52	1	1	2	2	2	2	3	50	53		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	108	6	114	1	1	2	2	2	2	8	109	117		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	71	3	74	1	1	2	2	2	2	3	71	74		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	57	5	62	1	1	2	2	2	2	6	57	63		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	62	1	69	1	1	2	2	2	2	4	70	73		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	102	8	110	1	1	2	2	2	2	8	102	110		
4	1	8	4	1	1	1	1	2	3	3	15	2	3	3	3	32	1,013	80	1,093	2	1	12	6	15	21	95	1,019	1,114		
2	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	11	9	20	1	1	2	2	2	2	10	11	21		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	59	2	61	1	1	2	2	2	2	4	61	65		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	103	4	107	1	1	4	2	6	6	107	113			
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	119	9	128	1	1	4	2	6	6	120	129			
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	117	9	126	1	1	4	2	6	6	124	133			
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	188	11	199	1	1	4	2	6	6	12	195	207		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	51	4	55	1	1	4	2	6	6	4	52	56		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	57	5	62	1	1	4	2	6	6	58	64			
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	61	4	65	1	1	4	2	6	6	62	66			
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	118	4	122	1	1	4	2	6	6	7	125	132		

F.—Position and distribution of troops in the

POSTS.	SITUATIONS.	COMMANDING OFFICERS.	Number of companies.	GARRISONS.	PRESENT.				
				Regiments.	General officers.	Military secretary.	Adjutant-general.	Inspector-general.	
DEPARTMENT OF COLUMBIA.—Cont'd.									
Fort Hall, I. T.	130 miles north of Corinne, U. T., nearest station on U. P. R. R.	Capt. J. E. Putnam, 12th Inf.	1	12th Inf.					
Fort Boisé, I. T.	In Boisé River Valley.	1st Lt. Lafayette Hammond, 23d Inf.	1	23d Inf.					
Sitka, A. T.		Maj. J. C. Tidball, 2d Art.	2	2d Art.					
Total.			19		1	2	1		
DEPARTMENT OF ARIZONA.									
Headquarters.	Prescott, A. T.	Lt. Col. George Crook, 23d Inf.		Department staff.				1	
Camp Apache, A. T.	In White Mountain country, about 60 miles N. by E. from Camp Goodwin.	Maj. John Green, 1st Cav.	3	1st Cav. and 21st Inf.					
Camp Bowie, A. T.	At Apache Pass.	Maj. A. W. Evans, 3d Cav.	2	3d Cav. and 21st Inf.					
Camp Crittenden, A. T.	45 miles south of Tucson	Capt. Evan Miles, 21st Inf.	2	21st Inf.					
Camp Date Creek, A. T.	In Skull Valley, on road from La Paz to Prescott.	Capt. R. F. O'Beirne, 23d Inf.	2	3d Cav. and 21st Inf.					
Camp Grant, A. T.	On the San Pedro River, 60 miles north of Tucson.	Capt. Wm. Nelson, 21st Inf.	2	3d Cav. and 21st Inf.					
Camp Hualpai, A. T.	On the Mojave Road, about 40 miles N. W. of Prescott.	Maj. J. V. Du Bois, 3d Cav.	2	3d Cav.					
Camp Lowell, A. T.	At Tucson	Maj. H. R. Mizner, 12th Inf.	2	21st Inf.					
Camp McDowell, A. T.	On the Rio Verde, 52 miles north of Maricopa Wells.	Maj. N. A. M. Dudley, 3d Cav.	4	3d Cav. and 21st Inf.					
Camp Mojave, A. T.	On the Colorado River, 209 miles north of Fort Yuma, Cal.	Capt. R. H. Pond, 12th Inf.	1	12th Inf.					
Camp Verde, A. T.	On the Rio Verde, 38 miles from Prescott.	Lt. Col. C. Grover, 3d Cav.	3	3d Cav.					
Fort Whipple, A. T.	Near Prescott, A. T.	1st Lt. W. H. Boyle, 21st Inf.	1	21st Inf.					
Fort Yuma, Cal.	At junction of Gila and Colorado Rivers.	Lt. Col. F. Wheaton, 21st Inf.	1	12th Inf.					
In the field, A. T.		Lt. Col. Geo. Crook, 23d Inf.	5	1st & 3d Cav. & 12th Inf.					
Total.			30						
Grand total	Military Division of the Pacific.		65		3	2	2		

ADJUTANT GENERAL'S OFFICE, Washington, D. C., October 20, 1871.

Military Division of the Pacific, &c.—Continued.

PRESENT.																	ABSENT.							PRESENT AND ABSENT.						
Bureau of Military Justice.	Quartermaster's Department.	Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Military storekeepers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and reg'l staff officers.	Captains.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.	
				1								1				2	54	3	57									3	54	57
			1													2	29	3	32			1			1	1	1	4	29	33
	1						1				1	1				5	117	9	126			1	1		3	2	5	11	120	131
2	110	3					3				4	14		1	1	35	1,084	76	1,160	1	1	5	6	34	13	47	89	1,118	1,207	
3	1	3					1			1							11	10	21									10	11	21
											1	3				3	190	7	197			2	5	2	7	9	9	195	204	
											1	2				2	130	5	135			1	1	1	1	2	6	131	137	
												1				1	103	2	105			1	3		4	4	6	103	109	
											2					4	115	6	121								6	115	121	
											2					2	144	4	148			1	2	1	2	1	3	5	146	151
											1	2				1	125	4	129			3	3	3	3	6	7	128	135	
											1	1				2	102	4	106			1	2		3	3	7	102	109	
												1	4			4	229	9	238			4	30	4	34	13	250	272		
												1				2	55	3	58								3	55	58	
							1			1		3		1	1	4	241	11	252			1		2	1	3	12	243	255	
		1														2	56	4	60			1			1	1	5	56	61	
		1								1		1		1	1	2	85	7	92			2			2	2	9	85	94	
		1										3				8	325	12	337			2	1		3	3	15	325	340	
3	1	4	3				2	1		3	5	25		2	2	37	1,911	88	1,999			3	5	17	43	25	68	113	1,954	2,067
11	524	11	1				8	4	2	6	9	54		5	6	104	4,018	258	4,276	1	6	11	35	83	53	136	311	4,101	4,412	

E. D. TOWNSEND *Adjutant General.*

REPORT OF THE INSPECTOR GENERAL.

REPORT OF THE INSPECTOR GENERAL.

HEADQUARTERS ARMY OF THE UNITED STATES,
INSPECTOR GENERAL'S OFFICE,
Washington, D. C., October 17, 1871.

SIR: Since the date of my last annual report the stations and employment of the Inspectors General and of the Assistant Inspectors General have been as follows, viz:

During the year, except when on special duty, I have been in charge of the Inspector General's Office, at the Headquarters of the Army, in the War Department, generally supervising the inspection branch of the service. The work of the office has been of similar character to that set forth in my last annual report. I have also been engaged in special duties, under the instructions of the Secretary of War and the General of the Army, during several months of the year.

Special Order No. 260, War Department, Adjutant General's Office, July 3, 1871, appointed me as president of a board to convene in New York City on the 15th of July, for the purpose of preparing "a system of regulations for the administration of the affairs of the Army," under the special instructions of the Secretary of War. From the time of the assembling of this board until now I have been occupied with the duties specified in the above-mentioned order.

Inspector General D. B. Sacket has continued on duty during the year at the headquarters Military Division of the Atlantic, and in that period has made thorough and careful inspections of nearly all the garrisoned posts throughout the division. Many of them have been inspected twice during the year. The headquarters and staff departments have been inspected with careful attention. Inspector General Sacket has also been occupied in other important duties during the year.

Inspector General Edmund Schriver continued on duty in the War Department as staff officer near the Secretary of War, and as inspector of the Military Academy at West Point, until the 15th April, 1871, when he was relieved by Special Order No. 139, War Department, Adjutant General's Office, current series. He has remained on duty in Washington City under the special instructions of the Secretary of War, having charge of the Inspector General's Office in the absence of Inspector General Marcy, and performing such other services as directed by Special Orders from the Adjutant General's Office and the verbal orders of the Secretary of War.

Inspector General James A. Hardie has continued on duty during the year at the headquarters Military Division of the Missouri, engaged in the ordinary duties of the inspection service at that station. He has also been occupied in the following important duties:

1. In the investigation of the Montana Indian War claims of 1867,

under the instructions of the Secretary of War, pursuant to the requirements of the act of Congress approved July 15, 1870.

2. In investigating the Kansas Price Raid claims, as commissioner appointed under an act of Congress approved February 2, 1871.

3. As commissioner under an act of Congress approved February 9, 1871, to fix the value of a portion of the military reservation at Fort Leavenworth.

Inspector General Hardie is now engaged in completing his report on the Montana claims, to be submitted on the assembling of Congress.

Assistant Inspector General Nelson H. Davis continued on duty under the orders of the commander of the Department of the Missouri, engaged in the usual duties of the inspection service, until December 25, 1870, when, under Special Order No. 349, War Department, Adjutant General's Office, December 8, 1870, he availed himself of four months' leave of absence on surgeon's certificate of disability, with permission to go beyond sea. This leave was afterwards extended three months. Assistant Inspector General Davis returned to his station on July 17, 1871, since which time he has been occupied on special duty in New Mexico, and on other important duties under the orders of the department commander.

Assistant Inspector General Roger Jones has continued during the year on duty at the headquarters Military Division of the Pacific, and has been actively engaged in making thorough inspections of the various posts and troops in the departments of California and Arizona. He has also carefully inspected all the offices of the several staff departments in San Francisco. Besides this, during the year, numerous important matters have been referred to him by the division commander for investigation and report.

Assistant Inspector General Absalom Baird was relieved from duty in the Department of Dakota and assigned to duty at the headquarters Military Division of the South by Special Order No. 284, Headquarters of the Army, Adjutant General's Office, October 24, 1870. Before reporting at his new station, Major Baird made some important inspections of the posts on the Missouri River, including the Whetstone, Crow Creek, and Lower Brulé Indian agencies. Since reporting at the headquarters Military Division of the South, Major Baird has been employed in making general and special inspections of the posts and troops in the division, and in investigating matters in the staff departments, under the orders of the division commander.

Assistant Inspector General E. H. Ludington has continued on duty at the headquarters Department of the Columbia during the year. The posts in this department are so widely scattered, and the routes of communication so difficult, that it is impracticable for the inspector to visit each post oftener than once in a year. Major Ludington's reports show him to have made one thorough inspection of each post throughout the department except one. He has also performed other important duties, making confidential inspections and serving upon general courts-martial, under the orders of the department commander.

The number of regular inspectors having been insufficient to meet the requirements of the inspection service, three lieutenant colonels, five majors, four captains, and one lieutenant have, from time to time during the year, been detailed to act as assistant inspectors general.

The reports of the inspections made during the past year exhibit a continued improvement in the instruction, discipline, and moral tone of the Army. The unusually large number of desertions that have taken

place within the past few months are generally attributed to the reduction of the pay of the soldier under the act of July 15, 1870.

Although this reduction resulted from the limitation specified in the act of April 6, 1869, yet there are doubtless many men who enlisted prior to the time the reduction went into effect who were under the impression at the time of enlisting that they were to receive \$16 per month during the entire term of their service, and they now profess to regard the reduction of pay as a violation of contract on the part of the Government, which, as I am informed, they plead in extenuation of their desertion.

Whether the representations of recruiting parties afforded any reasonable grounds for such erroneous conclusions, I am unable to say, but should Congress by enactment extend the provision of the larger allowance of pay during their periods of enlistment to those soldiers who entered service prior to July 1, 1871, this would remove all cause of complaint so far as relates to the good faith of the Government, and I have no doubt it would in the end prove to be a measure of economy.

R. B. MARCY,

Inspector General, United States Army.

Brigadier General E. D. TOWNSEND,
Adjutant General, United States Army.

REPORT OF THE JUDGE ADVOCATE GENERAL.

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REPORT
OF
THE JUDGE ADVOCATE GENERAL.

WAR DEPARTMENT,
Bureau of Military Justice, October 1, 1871.

SIR: In compliance with your direction, communicated through the Adjutant General by circular of the 9th ultimo, I have the honor to submit the following report of the business of this Bureau during the past twelve months, or since my last official report :

1. Number of records of military courts received, revised, and registered, 12,194.

2. Number of special reports made in regard to court-martial proceedings, upon application for the remission of sentences, upon claims against the War Department, and upon the miscellaneous questions of law referred for the opinion of the Bureau, 915.

3. Abstracts of proceedings of trials furnished to the proper officials of the War and Treasury Departments, 1,400.

The additional work, heretofore imposed upon the Bureau, of arranging, indexing, &c., the official papers of the late Colonel L. C. Turner, judge advocate, has been completed within the past year. That of similarly arranging the almost equally numerous files of the late Provost Marshal Baker is still in progress.

Owing to the failure of Congress to make the appropriation formerly customary for the expenses of copying records of trials, the business of the Bureau has been frequently retarded and embarrassed by the necessity of imposing this extra labor upon the small clerical force at the office. Persons who have been tried by general court-martial are *entitled* by statute (the ninetieth article of war) to copies of the proceedings, often very voluminous, in their cases. To have these copies prepared is imperative upon the Bureau; but its other public business cannot be carried on with the proper dispatch while their preparation is imposed upon its small number of clerks. It is therefore urged upon the Honorable Secretary that he will recommend to Congress the continuance of the appropriation by means of which special copyists were heretofore paid for the necessary work referred to.

Respectfully submitted.

J. HOLT,
Judge Advocate General.

The SECRETARY OF WAR.

REPORT OF THE QUARTERMASTER GENERAL.

REPORT

OF

THE QUARTERMASTER GENERAL.

QUARTERMASTER GENERAL'S OFFICE,
Washington, D. C., October 19, 1871.

SIR: I have the honor to submit the annual report of operations of the Quartermaster's Department during the fiscal year ending June 30, 1871.

On July 1, 1870, the balance of appropriations to the credit of the Quartermaster's Department in the Treasury undrawn, was, by report of last year.....	\$1,282,473 22
And it was estimated that there remained in hands of disbursing officers or in public depositories subject to their drafts, about \$1,500,000, to be applied to paying off the accounts and vouchers for liabilities properly incurred, and to completing contracts properly entered into during the year.	
Amount deposited to credit of appropriation for the Quartermaster's Department, derived principally from sales during the year of public property purchased with appropriations of former years.....	1,078,065 63
Sums expended by this Department on account of other departments, and by them refunded.....	349,711 66
Total.....	2,710,250 51
Requisitions drawn by Quartermaster General's Office on account of settlements made by the accounting officers of the Treasury of claims and accounts.....	1,812,234 24
Balance in Treasury undrawn July 1, 1871, on account of appropriations for the Quartermaster's Department, for years prior to July 1, 1870..	898,016 27
Appropriations for fiscal year ending June 30, 1871, appropriated by act of 15th July, 1870.....	\$11,400,000 00
Appropriated for deficiencies, act of 3d March, 1871....	1,050,000, 00
Amount refunded during the fiscal year on account of overpayments.....	25 00
	\$12,450,025 00
Remittances to officers for disbursement on requests of the Quartermaster General.....	\$12,072,891 22
Requisitions by the Secretary of War on requests of the Pay Department.....	155,000 00
Requisitions on account of settlements made by the accounting officers of the Treasury on claims and accounts allowed by them.....	222,133 78
	12,450,025 00

The remittances on account of the appropriations for the fiscal year have been made upon estimates from the disbursing quartermasters, approved by their commanding officers, and have been distributed among the divisions, departments, and general depots as follows:

To the Military Division of the Atlantic:	
Estimate chief quartermaster, headquarters	\$4,786 28
Department of the East	378,358 40
Department of the Lakes	84,317 62

Total Division of the Atlantic..... \$467,462 30

To the Military Division of the South:	
Estimate chief quartermaster, headquarters.....	\$99,533 03
Department of the South	627,198 73
Department of Texas	1,869,129 76
Depot of New Orleans	243,075 91
Total Division of the South.....	\$2,838,937 43
To the Military Division of the Missouri:	
Department of the Missouri.....	1,420,625 28
Department of Dakota	1,044,489 97
Department of the Platte	1,004,340 22
District of New Mexico.....	614,336 59
Depot of St. Louis.....	445,912 51
Depot of Chicago.....	307,956 91
Total Division of the Missouri.....	4,837,661 48
To the Military Division of the Pacific	2,408,009 62
To the principal depots:	
New York.....	434,481 42
Philadelphia	285,346 73
Washington	571 956 00
Jeffersonville	138,695 04
Total to principal depots.....	1,430,479 19
West Point, New York.....	73,647 00
Springfield Armory.....	3,234 08
Columbus Arsenal.....	1,327 20
Indianapolis Arsenal	974 13
Watertown Arsenal	5,352 55
Alleghany Arsenal	1,640 00
Watervliet Arsenal.....	3,676 24
Frankford Arsenal.....	440 00
Total to independent posts.....	90,341 20
Drawn on requisition of the Paymaster General.....	155,000 00
Amount of Treasury settlements	222,133 78
Total amount remitted	12,450,025 00

At the close of the fiscal year some money remained in hands of disbursing officers and in depositories, subject to their drafts, for payment of accounts and liabilities properly incurred during the year, but accounts for which had not been settled and paid on the last day of the fiscal year.

Whatever balance remains upon settlement of the accounts will be deposited in the Treasury to the credit of the appropriations of the Quartermaster's Department.

The accounts and vouchers which have passed the administrative examination of this office and been transmitted to the Treasury for final examination and settlement, since the last annual report, show disbursements—

From appropriations of years prior to the fiscal year ending June 30, 1871, amounting to	\$34,038,936 89
In the fiscal year ending June 30, 1871.....	612,940 36
Total	34,651,877 25

Appropriations are charged with these disbursements as follows:

1st. Appropriations for the Quartermaster's Department, viz:

Regular supplies	\$9,923,633 18
Incidental expenses	3,559 573 00
Purchase of cavalry and artillery horses	939 567 08
Barracks and quarters.....	5,878 130 04

Transportation of the Army	\$12, 129, 849 19
Mileage, transportation of officers and baggage	542, 276 58
Material for and amount expended in the purchase and preparation of clothing, camp and garrison equipage..	323, 732 78
Purchase of stoves	202, 605 57
National cemeteries	1, 033, 428 05
	<hr/> \$34, 532, 795 47

2d. Special appropriations and expenditures for other departments, viz:

Medical Department	4, 779 50
Ordinance Department	80 24
Subsistence Department	106 28
Pay Department	255 98
Bureau of Indian Affairs	35, 194 59
Bureau Refugees, Freedmen and Abandoned Lands	36, 138 77
Army contingencies	11, 510 79
Military telegraphs	7, 559 22
Transportation, &c., of prisoners of war	6 35
Reconstruction service	8, 833 62
Care, &c., sick and disabled soldiers	94 64
Collecting, drilling, and organizing volunteers	1, 243 60
Twenty per cent. additional compensation	217 80
Hospital-tax fund	13, 060 40
	<hr/> 119, 081 78

Total disbursements exhibited by the accounts examined during the past year	<hr/> 34, 651, 877 25
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The accounts examined since the last annual report, from which the above statement is made, number 6,401. The number examined in the previous year, as shown by the last annual report, was 1,754, covering disbursements to the amount of \$11,132,157 02.

Of the unexamined accounts, numbering 5,055; 26 relate to disbursements in the year 1868; 435 in the year 1869; 2,637 in the year 1870; and 1,957 in the year 1871. The number of property returns examined during the year is 16,419, embracing vouchers to the number of about 195,000. The number examined in the preceding year was 7,475. The number remaining in the files of the office, unexamined at this date, is 7,815, of which 146 pertain to the year 1868; 1,674 to the year 1869; 4,091 to the year 1870; and 1,904 to the year 1871.

The unexamined accounts for 1868 and 1869 are those of regular disbursing officers of the Department, all accounts of acting assistant quartermasters for the period having been disposed of. These are now under examination, and will be forwarded to the Treasury as soon as possible.

All accounts subsequent to February, 1869, have received a preliminary examination; and as the officers have been advised of all obvious errors, and been allowed ample opportunity to correct them, much correspondence will be avoided in future, and the work of settlement will be materially facilitated. The accounts of all officers who left the service under act of Congress approved July 15, 1870, reorganizing the Army, have been adjusted in this office.

In addition to this, 95 settlements have been made under act of Congress approved June 23, 1870, authorizing the settlement of accounts suspended on account of loss of funds, vouchers, &c., originating since the commencement of the late war, and prior to August, 1866. The amount covered by these settlements is \$43,814 21. The whole number of final settlements made during the year is 479.

The examination of accounts and returns has been very much in arrears for many years, the small clerical force available for that purpose being

entirely inadequate for the work ; but the amount accomplished during the past year seems to indicate that in one year from this date the work will be practically up to date.

Fifty-one clerks are employed in this branch of the office : one of class four; four of class three; seven of class two, and thirty-nine of class one. It will be seen that nearly four-fifths of the entire number are in the lowest grade, and that in the ordinary course of events a meritorious clerk may remain in the faithful discharge of highly responsible duties for years without promotion. As an inevitable consequence of this, the office loses the service of many of the most valuable clerks of the lower grades, who leave the service entirely, or seek positions in offices which afford better chances for recognition and advancement. I have the honor to suggest that the efficiency of this important branch of the office would be greatly increased by a readjustment of the grades in such a manner as to make promotion possible as the reward of faithful service.

To effect a better organization of the branch, I recommend that an addition of two clerks of class four, two clerks of class three, and four clerks of class two be made, and that a corresponding decrease be made in the number now in class one.

The Quartermaster's Department is charged with the duty of providing means of transportation by land and water for all troops and for all the material of war. It furnishes the horses for artillery and cavalry, and the horses and mules for the wagon-trains. It provides and distributes clothing, tents, camp and garrison equipage, forage, lumber, and all materials for camps, and for shelter of the troops and stores. It builds barracks, hospitals, and store-houses; provides wagons and ambulances, harness, except for cavalry and artillery horses; builds or chartered ships and steamers, docks and wharves; constructs and repairs roads, railways, and their bridges; clothes the Army, and is charged generally with the payment of all expenses of the movements and operations of the Army not expressly assigned by law and regulation to any other department. Arms, ammunition, medical and hospital stores, and subsistence stores are purchased and issued by other departments, but the Quartermaster's Department transports them all to the place of issue in camp, garrison, or in the field, and on the field of battle. These duties have been efficiently performed during the year.

The corps of quartermasters is not large enough to afford officers for the smaller military posts. The nature of our military service requires a great number of military posts, garrisoned each by a few companies, and the work of the Department at these posts is generally done by lieutenants of the line, detailed as acting assistant quartermasters.

Their work is responsible and onerous. They incur responsibility for large quantities of property, and sometimes a heavy money responsibility, occasionally involving them in severe losses. For this duty they receive no special compensation beyond the pay of their lineal rank. Under these circumstances the duty is not desirable, and it is avoided rather than sought. The number of line officers who, during the fiscal year, have been on duty as acting assistant quartermasters, is reported at 433. Through their hands large amounts of public money pass. They are charged with operations in the erection of quarters, barracks, and store-houses, involving very heavy expenditures. They have charge of the stables and of the public animals, on whose condition depend the success of military operations, and that regularity of supply and transportation which is essential to the comfort, health, and efficiency of the troops. So important a duty should be sought, not imposed, and the

allowance of some moderate sum to cover the responsibility, and compensate the officer for the losses to which he is exposed, such as is allowed to acting assistant commissaries, is very desirable. The difference in the cost of all military structures, and in the length of service and condition of animals, wagons, and all materials of transportation, which would be made by the selection of the most intelligent and efficient business men among the lieutenants of the line for the duty of acting assistant quartermasters, would amply repay the small amount required to pay this allowance.

The average number of line officers on duty as acting assistant quartermasters during the past fiscal year was 150; the total number who so acted, 433, showing that they are frequently changed. The amount of an allowance of \$100 per year to each would be \$15,000. The amount to be saved by making the service desirable, one to be sought by intelligent officers desirous of remaining on duty instead of being relieved from it, is many thousand dollars per annum.

The officers of the establishment are stationed at the principal purchasing and distributing centers as purchasing and disbursing officers. They are not as numerous as economy requires, and four have resigned and one has died since my last annual report was rendered, whose places, under the laws as they now stand, it is not possible to fill.

The interests of the military service require the removal of the restriction upon appointments to the Quartermaster's Department, and the Treasury would be benefited still more than the Army by its repeal.

This office still remains in the building on Fifteenth street, constructed for a hotel, and not fire-proof, and not a fit or safe depository for its records. It is too distant from the War Department for convenient dispatch of business, and it is very desirable that shelter, fire-proof and safe, should be provided for it at the earliest date. The extension of Winder's building, as the speediest mode of making such provision, was recommended last year, but no action was taken. An appropriation has been made, however, for the erection of a building for the State Department, which, when extended to the north, will furnish space for the Navy and War Departments. A great misfortune, liable at any moment to occur, may be perhaps now best guarded against by early provision by law for the speediest completion of the whole building by all those appliances which, in the present high condition of the engineering and constructive arts, enable architects and engineers to complete in a few months what was formerly the labor of years.

The whole of these buildings could, I doubt not, were Congress so to enact, be pressed to completion within less than two years from the time a sufficient appropriation is granted.

The power to employ a considerable number of clerks temporarily would enable this office to bring up to date the examination of accounts still in arrears, and thenceforward to make such daily current examination of accounts as received as would enable it to detect any considerable error immediately. I have repeatedly made this recommendation without success, and the danger of loss still remains.

Every operation of the officers of the Department, from the purchase of an ocean steamer to the issue and consumption of a horse-shoe in Arizona, is necessarily the subject of record, which, in the course of time, reaches this Department, and is filed here or in the Treasury.

Every operation of purchase, of supply, of use, creates rights and interests which may, at some future time, be the subject of reclamation and discussion. The system in use is simple and thorough. Whenever, after years, a question is raised, the information is found upon the

records, but the handling and examination of these records as they arrive, to detect errors and omissions, and their proper index, arrangement, filing, and preservation so as to be of convenient access after months and years have elapsed, require a considerable number of experienced and intelligent clerks.

PUBLIC ANIMALS.

No appropriation was made for mounts and remounts of the cavalry and artillery by the Army appropriation bill of July 15, 1870, and the balances of former appropriations, which had, till that time, been available for the service of the ensuing fiscal year, being withdrawn by the law of July 12, 1870, there were no means during the early part of the year to purchase horses. The deficiency bill of March 3, 1871, appropriated \$200,000 for this purpose, but this was not sufficient to remount many dismounted cavalymen, and the force lost, in some degree, its efficiency for want of horses; and though efforts were made to supply these wants as soon as the deficiency appropriation was made, the close of the fiscal year 1870-'71 still left the cavalry insufficiently mounted for want of funds for purchase.

There were purchased during the year 1,763 cavalry horses, at a cost of \$166,689 24. The average price was: in Texas, \$69 36; in Department of Columbia, \$75; in Department of the Platte, \$135 13; of Missouri, \$142 50; of California, \$162 49.

One thousand two hundred and thirty-five horses were sold during the year for \$63,350 13, and, under orders of the Secretary of War, 11th May, 1870, to reduce the whole number of train animals, with the reduction of the Army itself, to 10,500,

There were sold, 4,532 mules for	\$362,339 26
23 oxen for	620 48
<hr/> 4,555 beasts for	<hr/> 363,019 74

The proceeds of all these sales have been deposited in the Treasury to the credit of the proper appropriations.

The losses during the year reported were: Died, 530 horses, 565 mules, and 10 oxen; lost, abandoned, or stolen, 1,185 horses, 569 mules. The 1,235 horses sold, being nearly all cavalry horses, represent the number which, being disabled or worn out, could be disposed of by sale. There remained in service on the 30th June, 1871, 7,996 horses, 9,756 mules, and 124 oxen.

FORAGE AND STRAW.

Over 250 contracts for forage have been made during the year, some of them for indefinite quantities to be delivered as needed where the consumption is small or irregular, others for definite quantities as follows:

Two hundred and fifty-one thousand eight hundred and ninety-six bushels of corn, 266,734 bushels of oats, and 41,413 tons of hay, and 2,392 tons of straw. But this does not represent the full consumption of the Army of any one of these articles.

The issues of forage and straw during the fiscal year have been as follows: Corn, 770,660 bushels; oats, 1,059,601 bushels; barley, 175,113 bushels; hay, 51,165 tons; straw, 3,962 tons.

FUEL.

Contracts are reported for 42,355 tons of coal, and 93,150 cords of wood, and 20,399 bushels of charcoal.

The issues of fuel during the fiscal year have been as follows: Wood, 124,372 cords; anthracite coal, 19,492 tons; bituminous coal, 9,186 tons.

Fire-extinguishers have been supplied to a number of military posts during the year. Fires at Fort Hays, Kansas, Fort D. A. Russell, Wyoming, Fort Ripley, Minnesota, and at San Antonio Depot, Texas, have been extinguished by their aid, and much valuable property has been thus saved from destruction. At a fire at Fort Buford, on the Upper Missouri River, which occurred in January, 1871, the thermometer was at 14° below zero, and the fire extinguishers were frozen. The fire was ultimately extinguished by water from the Missouri river.

HORSE-SHOEING.

A report entitled "Hints on Horse-shoeing" has been prepared by Mr. John Kiernan, an Army farrier, skilful in the Dunbar method, which was taught to the farriers of the Army under requirements of the joint resolution No. 105, of July 28, 1866, Statutes at Large, vol. 14, page 613. Having been submitted to this office, it was laid before a board of officers assembled by order of the Secretary of War at Fort Riley, Kansas, in January last. The board reported favorably, and recommended the publication of the report in order to continue the instruction and preserve the knowledge of this system, which has been found valuable in the Army. It is in the hands of the Public Printer.

CONTRACTS.

Five hundred and eighty-seven contracts were examined and filed in this office during the fiscal year: 253 for forage and straw; 165 for fuel, of which 12 also included some supply of forage; 20 for building-materials; 16 for building and repairs; 35 for transportation; 8 for cavalry horses; 25 for national cemeteries; 43 leases; 4 for clothing, camp and garrison equipage. The remainder for services, stationery, charters, &c.

CLOTHING, CAMP AND GARRISON EQUIPAGE.

The clothing in store has been overhauled with a view to its preservation and the condemnation and sale of such as has suffered from the ravages of moths, mildew, and decay. Much of the clothing, though packed in tight bales and boxes, lined with petroleum paper, has been exposed since its manufacture, either by being sent to the field and there opened for issue, or by injury to the boxes or wrappings, and the loss by the moth consequent upon such exposure has been large.

A general inspection has resulted in condemnation and order for sale of large quantities at Jeffersonville, the western, and at Schuylkill Arsenal, the eastern depot.

Unless the fire which has destroyed the business portion of Chicago while this report is in preparation so cripples the purchasers at the sale of September 13, at Jeffersonville, as to prevent their taking the goods purchased by them, that sale will realize to the United States about \$1,270,000.

A sale at Schuylkill Arsenal, in September, produced \$226,000.

During the fiscal year ending June 30, 1871, sales at Philadelphia, Jeffersonville, New Orleans, San Antonio, and smaller sales at other posts, realized the sum of \$379,728 84.

The total public sales of military clothing and equipage of this Department since June 30, 1870, have, therefore, amounted to \$1,875,728 84.

The expenses of purchase and manufacture, repacking, and assorting

the clothing and equipage in store during the fiscal year amounted to \$201,143 12.

As the general appropriation bill for the fiscal year forbade the use of balances of former appropriations and of proceeds of sales of materials, some embarrassment was experienced in clothing the Army, owing to the exhaustion of the supply in depot of some articles of equipment, particularly the garments of larger sizes. The only recourse left was to issue with such clothing, smaller than called for, cloth to be used in enlarging the garments by the company tailors. This necessity ceased upon the passage of the deficiency bill, which contained an appropriation of \$200,000 for clothing and equipage during the latter part of the fiscal year.

The stock of clothing and equipage is still very large in some items, but others are exhausted, and larger appropriations will be hereafter needed to purchase and manufacture what is needed.

The deterioration of the knapsacks by some chemical change in the black paint applied to them has rendered the whole stock remaining from the war unfit for use, and they have been condemned and sale ordered. A new supply is being prepared, and two thousand hair-seal skins from Alaska have been purchased, to be used in covering knapsacks, after a model submitted by Major J. C. Tidball, Second Artillery. These are being manufactured in San Francisco. Two thousand leather and canvas knapsacks, of a pattern selected by the General of the Army from various models submitted to the Quartermaster General's Department, have been manufactured by contract in Philadelphia.

The British war department has lately adopted an entirely new style of equipment, devised by a committee of officers of rank in the line and in the medical department, after several years' investigation and of experiment in use by the troops, known as the valise equipment. A description of these has been obtained, and models are being made at the Schuylkill Arsenal for submission to the War Department.

The experiments of the British army have been apparently thorough, and it is possible that it may be found that this equipment should be adopted for our troops. Until this is decided, the further manufacture of knapsacks is suspended.

A knapsack is a great burden to a soldier, and none has been devised which can be worn by all soldiers with ease and comfort. The best must be but a choice of evils. But as it is now necessary to provide knapsacks for the whole Army, the opportunity will be taken to thoroughly study all devices, and to endeavor to adopt the best.

Haversacks suffered from the same chemical change as the knapsacks. The new supply is being made of enameled cloth.

Complaints of boots and shoes made in the Department of Arizona led to the return of several samples to this office for examination, and the strength of the leather and of the sewed seams was carefully tried in a testing machine and but little difference was found from those now being made of new leather and thread. In some samples the old material showed the greater strength.

I am of opinion that complaints of want of durability of shoes and boots, coming generally from certain very rocky and stony districts, are due generally to neglect to guard the soles with iron nails, a precaution taken by every Alpine tourist before he ventures among the rocks. Attention of officers has lately been specially called to this subject.

It has been necessary to purchase some boots and shoes of smaller sizes, for, while the troops draw the larger sizes of clothing, they take the smaller boots and shoes. In a portion of those purchased by con-

tract, brass-wire screws are used in the seams instead of thread or wooden pegs.

It is believed that these shoes, though at present rather more costly than sewed or pegged shoes, will be better suited to the hard work and various soils to which they are exposed in Army use.

A certain quantity of material for tents and for clothing has been subjected to a process alleged to be preservative by protecting the material from the attacks of moths and of mildew. The result is not yet developed, but thus far the process gives promise of success.

But six claims for clothing and equipage taken during the war have been received during the year. They amount to \$9,165 05. Most of these have been settled, some being retained, awaiting further proof.

Full tables accompanying this report give detailed information in relation to the clothing and equipage on hand, and disposed of in various ways during the year.

Many years since it was ordered by the War Department that the wooden bunks, used in barracks, difficult to keep clean and affording harbor for vermin, should be replaced by single iron bunks. The war interfered with the provision of such bunks, very necessary to health and morale of troops, and the work is now in progress. The estimates submitted for the next year contemplate the completion of this work.

The service to which these iron bedsteads are exposed in barracks is severe, and several patterns heretofore in use have failed in actual service.

Two patterns are now manufactured, which are believed to be well fitted for use. They have been tried at several posts, and thus far always with favorable results. One is made of bar-iron, the other of gas-pipe; both have wooden slats to support the bed, and are easily taken apart for transportation. Both are so arranged that in the daytime they can be piled three tiers high without disturbing the bedding, but when in use at night they are all put upon the floor, and no soldier will be obliged to sleep over his comrade's bed.

TRANSPORTATION BY RAILROAD.

There have been transported by the Quartermaster's Department by railroad during the year:

Persons	30,001
Animals	3,839
Freight, pounds, 68,660,523, or 34,330 tons.	

The bills for the railroad service during the year, paid by officers or examined in this office and referred to the accounting officers for settlement, amount to \$1,998,916 35. Of these, there were on account of—

Union Pacific Railroad, 390 accounts, amounting to	\$812,812 55
Kansas Pacific Railroad, 36 accounts, amounting to	255,603 85
Central Pacific Railroad, 20 accounts, amounting to	66,213 74
Western Pacific Railroad, 16 accounts, amounting to	1,730 50
	<hr/> 1,136,360 64 <hr/>

The movement on account of military service over the Union Pacific was, persons, 6,945; and pounds of freight, 24,245,385. Over the Kansas Pacific, persons, 4,323; and pounds of freight, 10,526,215. Central Pacific and Western Pacific Railroads, persons, 478; and pounds of freight, 977,188. Total military movement over the United States Pacific Railroads, 11,746 persons, and 35,748,788 pounds, or 17,874 tons of freight.

One-half the amount earned by these roads, and audited, has been paid to them in cash; the other half has been retained by the Treasury to apply on the interest of the bonds of the United States issued in aid of the railroads.

A great saving in the cost of supply of the troops in the interior and on the Pacific coast has been effected by these roads, and several military posts heretofore maintained at great expense have been abandoned as the railroads have reclaimed the wilderness. But it has been necessary to push the troops further north and south of the railroad lines in order to protect advancing settlements, and the opening and working of mines.

TRANSPORTATION BY WAGON.

Difficulties, owing to the offer of straw bids, delayed the usual contracts for land transportation in Texas, to the increased cost and expense of the Department.

The lowest bidders were not to be found; others, on technical or frivolous pretexts, refused to enter into contract, or to abide by the proposals they had sent in.

Similar difficulties arose in Dakota in contracting for both land and river transportation.

Such difficulties are inseparable from the contract system, yet it is on the whole the cheapest and best for so large a service. All delinquents are reported to the Department of Justice, in order that where it may appear to the judicial officers possible to punish them, or to recover upon their bonds and guarantees, they may be prosecuted.

The result of the suits has not yet been communicated to this office.

The movement by these wagon routes during the year has been, of persons, 3,287; of freight, 43,383,178 pounds, or 21,691 tons. The cost thereof, so far as ascertained and settled, has been \$1,457,543 40.

In the fiscal year ending June 30, 1869, the movement by wagon route was, persons, 3,839; freight, 27,316 pounds; costing \$1,673,508 44, showing a decrease in two years with the decrease of the Army, but not in proportion to that decrease. The country to be occupied is even more extensive, and the troops must make up by activity what they have lost in force of numbers.

The rates of wagon transportation have been, on route No. 2, Department of Missouri, \$1 21 per 100 pounds per 100 miles; on route No. 4, Minnesota and Dakota, \$1 27; on the Montana route, \$1 57½, which do not differ materially from those of 1868-'69.

TRANSPORTATION BY STAGE.

Six hundred and thirty-nine persons, and 881,815 pounds, or 221 tons of freight, were moved by stage during the year, at a cost of \$43,331 20. Tolls have been paid to the amount of \$18,098 31.

TRANSPORTATION BY WATER.

Seven steamers and two schooners have been in service as transports under charter during the year, at a cost of \$27,650 14.

Two steamers, two schooners, and two sloops, used by the United States, have been employed, at a cost of \$24,104 19.

The steam transport Newberne, employed in supplying troops in Alaska, was sold April 4, 1871, for \$55,000, coin, as after the withdrawal of most of the troops from Alaska her services were not necessary.

The total movement by water transport, reported during the year, is : 37,195 persons, 1,897 animals, and 58,884,996 pounds, or 29,442½ tons of freight, costing \$679,339 49.

A small steam-launch is being built to keep up communication between Fort Pulaski and Savannah, as no regular line, willing or able, at moderate cost, to do the necessary work, exists. The exposure of the troops in open row-boats in that malarious climate has been injurious to health. The labor has been very severe, and the service unsatisfactory.

The accounts for transportation during the year are not as yet all settled. Those from the Pacific railroads which have not been paid by local disbursing officers of the Department, but have been settled through the Treasury, in order that the proper credits may be given at the Treasury on account of earnings reserved to meet interest on United States bonds, come in some time after the rendition of service, and in settling these accounts the small balances of the appropriation of transportation, which can be restored by disbursing officers after settling the year's liabilities of their respective offices, will be exhausted.

The payment and settlements thus far made on account of transportation amount, as reported, to \$4,198,805 54; of this, \$2,452,269 25 has been paid through disbursing officers; \$1,746,536 25 has been examined in this office and transmitted to the Treasury for settlement, through the Third Auditor and Second Comptroller.

BARRACKS AND QUARTERS.

The appropriation for barracks and quarters pays for rent of all buildings rented, through the Quartermaster's Department, for the use of the Army. This includes rents of store-houses, offices for headquarters, and for disbursing officers, quarters for officers and for troops, military hospitals and hospital buildings. It is charged, also, with the commutation of quarters of soldiers on duty as clerks, with the construction and repair of all military buildings for use of troops and for shelter of their stores at old established posts, or at such new posts as may be established during the year.

The extension into the wilderness of railways and traveled routes, the settlement of agricultural and mining districts, require new stations to be occupied every year; and the return of a considerable force to the Southern States under the provisions of the enforcement bill has required expenditures in renting or erecting buildings for their shelter in places newly occupied.

The appropriations made by Congress for this purpose have not lately been sufficient to meet the actual wants of the Army, and the troops at many stations have been refused the means of providing such reasonable shelter as they have a right to expect and to ask for. Whatever the limited sums at the disposal of the Quartermaster's Department has enabled the War Department to do, has been done, but it has been necessary, for want of money applicable to the purpose, to refuse funds and materials for putting a number of posts into proper condition.

One hundred and thirty-five new buildings of all kinds have been constructed during the year under authority of the Secretary of War, at a cost of \$890,687.

They are in the States and Territories of Alabama, Arizona, California, Colorado, Louisiana, Dakota, Florida, Idaho, Kansas, Maryland, Massachusetts, Michigan, Nebraska, Nevada, New Mexico, New York, North Carolina, Oregon, South Carolina, Virginia, Texas, and Wyoming.

Three new wharves have been built, costing \$13,600.

Such reported necessary repairs of buildings as required special authority from the Secretary of War have been duly submitted for his action, and the sum of \$39,859 has been devoted thereto; but ordinary repairs, not involving heavy expenditures, have been made when necessary, and have consumed a large sum, which has not as yet been specially reported and separated from the general accounts of expenditures.

The expenditures for construction and repairs thus far analyzed show that the expenditures for different departments and divisions have been as follows:

Division of Atlantic:		
Department of the East	\$66,774	
Department of the Lakes	2,229	
		\$69,003
Division of the South:		
Department of the South	54,319	
Department of Texas	394,364	
		448,683
Division of the Missouri:		
Department of Missouri	216,689	
Department of Platte	130,000	
Department of Dakota	104,730	
		451,419
Division of the Pacific:		
Department of California	12,681	
Department of Columbia	12,400	
		25,081
		<u>994,186</u>

NEW POSTS.

A new post for one company has been established at the head-waters of the Rio Verde, Arizona, and one at the Sweetwater mines, Wyoming Territory, to be known as Camp Stambaugh.

There are about five thousand buildings of all kinds in charge of this Department; many of them, however, are of the rudest construction and of small original cost.

The shelter of the troops in the treeless regions now occupied is more costly than it was when the frontier posts were in thickly wooded districts. There are places in Texas and Arizona, and on the plains, where the timber necessary for roofing and flooring is hauled by wagon trains hundreds of miles. In such regions, adobe or rough stone walls are used for military buildings, and the cost of even these rude materials at the remote posts is very large.

One hundred and ninety-four buildings of various kinds, no longer needed, have been sold during the year.

BERGEN HEIGHTS ARSENAL, NEW JERSEY.

This property, under the requirements of the law of February 3, 1871, has been sold at public auction, after due advertisement. A deed has, as required by the law, been executed by the Secretary of War to John Halliard, the highest bidder, at the price of \$71,000, cash.

The property was purchased many years since, and the site then cost \$2,100. The buildings erected thereon by the United States were not large or valuable, the increased value arising principally from the appreciation of the ground.

The armory building in the public park or mall in this city, occupied during and since the war as a military store-house by the Quartermaster's Department, has been relinquished to the Territorial Government, for use of the District militia, for whom it was originally built by a special appropriation of Congress.

The barracks and engineer buildings at Yerba Buena Island, harbor of San Francisco, have been transferred to this Department.

Sites for necessary public buildings at Omaha, Nebraska, at Jeffersonville, Indiana, and at San Antonio, Texas, have been transferred by the citizens in the cities named to the United States.

The fire-proof warehouse at Jeffersonville, for which Congress made an appropriation of \$150,000, is now under construction by contract, and when completed it will enable the Department to dispense with many of the watchmen and other employes, reducing the annual expenses of the depot by a sum which, in a few years, will save more than the cost of the building.

The contracts offer a fair prospect of completing the building a little within the sum appropriated.

Many millions of dollars of military supplies now exposed to destruction by fire, and to guard which a large fire apparatus and many watchmen are necessary, will then be placed in security.

The completion of the depot at San Antonio, for which the city has given a site, will reduce the large rent-roll of the Quartermaster's Department in that city, now approaching \$25,000 a year.

EXPLORING EXPEDITIONS.

The expedition for exploration of parts of Nevada and Arizona, under command of Lieutenant G. M. Wheeler, Corps of Engineers, has been provided with a large part of its transportation by this Department, under orders of the Secretary of War, and the sum of \$37,435 has been placed at the disposal of its commander, for purchase of supplies at places at which those of the Quartermaster's Department may not be available.

Transportation and forage have also been supplied to the expedition of the 40th parallel, under Professor Clarence King, geologist.

Aid, by sale of supplies and loan of means of transportation for his party, has also, under order of the Secretary of War, been given in the exploration of the Upper Yellowstone country, to Professor Hayden.

INDEBTED RAILROADS.

At the beginning of the fiscal year, of the railroads which, in 1865, purchased the railroad equipment of the Quartermaster's Department, under orders of the President, twenty-three have paid off their debts in full, with interest.

Their payments amounted to	\$2,379,004 04
Twenty-eight roads were still in debt to the United States, the total debt, interest, and expenses paid being.....	2,265,584 29
Total collected.....	4,644,588 33
The debt, interest, and expenses remaining unpaid, amount to.....	\$4,646,522 68
During the fiscal year interest accrued upon this debt, and expenses chargeable to the companies have been incurred to the amount of....	\$274,323 71
Payments have been made, either in money, or in postal or in military transportation and services, to the amount of.....	196,495 86
Leaving a balance against the companies on the year's business, of.....	77,827 85
Which added to the debt of June 30, 1870, makes the total sum now due and unpaid by these railroads on July 1, 1871.....	4,724,350 53

Accompanying this report is a statement showing the original amount of the debt incurred by the companies, total interest and expenses to June 30, 1871, to which I refer for more detailed information.

Four companies have extinguished their debt during the year by paying or earning by postal and military transportation \$86,563 89. They are the Atlantic and North Carolina, the Macon and Brunswick, the Selma and Meridian, and the San Antonio and Mexican Gulf Railroads.

Ten companies have paid something on account of their debts and interest, in all \$78,538 10, and reducing the principal of their debt by the sum of \$39,333 38. They are the Alexandria, Loudoun and Hampshire; Alabama and Florida; Alabama and Chattanooga; East Tennessee and Virginia; Mississippi and Tennessee; Memphis and Ohio; Memphis and Little Rock; Pacific Railroad of Missouri; Southwest Branch of Pacific Railroad of Missouri; and Selma, Rome and Dalton.

Eleven companies, which have paid during the year \$31,393 87, have not paid enough to meet the accruing interest, so that their debt has increased during the year by \$200,403 17. They are, East Tennessee and Georgia; Edgefield and Kentucky; Knoxville and Kentucky; McMinnville and Manchester; Mississippi, Gainesville and Tuscaloosa; Memphis, Clarksville and Louisville; Mobile and Ohio; Nashville and Chattanooga; Nashville and Northwestern; Nashville and Decatur; New Orleans and Ohio.

The debt of the Indianola Railroad Company remains unchanged.

That of the Washington, Alexandria and Georgetown Company was paid off in full shortly after the close of the fiscal year on August 16, 1871.

The following table shows the debt on 30th June, 1871, of the principal delinquent railroads, with the payments or credits earned during the year, and the increase of debt and interest and expenses unpaid during the year:

Railroads.	Total unpaid June 30, 1871.	Total paid during the fiscal year.	Increase of debt during the year.
Nashville and Chattanooga.....	\$1,857,332 41	\$5,610 84	\$803,120 97
Nashville and Northwestern.....	701,720 87	24 20	36,622 57
Nashville and Decatur.....	321,340 18		20,400 00
Memphis, Clarksville and Louisville.....	444,067 66	1,727 71	23,428 30

The Nashville and Chattanooga has, however, given orders for the application of part of its mail earnings, that for the first three quarters of the fiscal year, but the Department has not yet succeeded in collecting the money.

The Nashville and Decatur refuses to give the necessary orders for the amount due for postal service, in accordance with its contract and bond.

At the last session of the Forty-first Congress a law was enacted authorizing the Secretary of War to compromise, adjust, and settle the suits pending against certain railroads on account of these debts, if, on advice of the counsel of record in these suits, he should deem it advisable.

On the 23d June this office was advised that, under this law, a proposition from the Nashville and Chattanooga Railroad Company had been accepted, to pay, in full of its debt the sum of one million of dollars, one-half ten years from the first of June, 1871, the other half twenty years

from the same date, interest at 4 per cent. per annum, to be paid semi-annually on the first days of December and June.

No progress has been made during the year in the suits against those companies which refuse to pay their debts, action being suspended under the law above cited.

Claims presented by the Nashville and Chattanooga, and Nashville and Northwestern Railroad Companies, for use and damage of their roads and property during the war, amounting, as claimed by the Nashville and Chattanooga Railroad, to \$4,557,092 64, and by the Nashville and Northwestern Road to \$848,140 69, referred to this office by the Third Auditor of the Treasury, to whom they had been presented after being rejected here, were duly returned with unfavorable report, and, on 12th June, 1871, the Auditor advised the Quartermaster General that he had rejected the claims, and that the Second Comptroller concurred in the rejection.

Claims of the East Tennessee and Virginia, and East Tennessee and Georgia Railroads, amounting, respectively, to \$751,200 07 and \$765,912 33, referred to this office by the Third Auditor, were returned on 18th July, also with recommendation that they be rejected.

CLAIMS.

Claims for services and for property not paid for at the time the liability was incurred by disbursing officers, are sent to this office for investigation and action.

Such as require the action of the Secretary of War are, after examination, reported to his office, with recommendation in each case. Others are referred to the accounting officers of the Treasury, with such information as this office can obtain from the reports of officers of the Quartermaster's Department, or others, and with such recommendation as may be proper. Others, again, are settled by reference for payment to a disbursing officer.

The law of 4th July, 1864, and acts amendatory thereof, imposed upon the Quartermaster General the duty of investigating the claims for quartermaster's stores alleged to have been used by the Army in the loyal and certain of the border States, with a view to the payment of such as were found to have originated within the prescribed limits, and to be just and payable within the rules laid down by the act of Congress, which were, generally, that the owner must have been loyal, the property taken for and used by the Army, and the claim just, and that it originated within the prescribed territorial limits.

In tables accompanying this report will be found detailed statements of the number and amount of claims of all classes presented to this office since the beginning of the war, and of the action taken thereon.

Claims for quartermaster's stores, under act of 4th July, 1864, chapter 240.

Under this act there have been filed 28,039 claims, for \$17,811,140 66; 4,950 of these, amounting to \$2,955,755 81, have been reduced \$877,672 76, and settled by reference to the Third Auditor for payment of \$2,078,083 05; 13,923 have been rejected, these amount to \$8,308,254 07; 6,231 have been suspended—amount, \$2,663,036 35; 3,935 have as yet received no decision, amounting to \$3,884,094 45.

During the fiscal year the number of these claims allowed was five hundred and twenty, amounting, as presented, to \$250,064 16; which were reduced in amount \$47,765 42, and the sum recommended to the

Third Auditor for payment thereon was \$202,298 74. Sixty such claims have been rejected during the year, amounting to \$132,148 07. There remain on file, not finally decided, 10,166 claims, amounting to \$6,547,130 80.

Miscellaneous claims filed in Quartermaster General's Office since commencement of the war.

There have been presented to this office since the commencement of the war, in 1861, 64,972 miscellaneous claims, amounting to \$33,436,254 90; of these 3,682, amounting to \$20,380,303 29, have been reduced by the sum of \$1,345,691 44, and settled by payment of \$19,034,611 85; 18,705 have been rejected, amounting to \$5,598,767 84; 5,281 have been suspended, amounting to \$1,220,210 08; which, with 9,304 not finally acted on, leave on file, for future decision, 14,585 miscellaneous claims, amounting, as presented, to \$7,457,183 82.

These miscellaneous claims represent the alleged purchases, seizures, contracts, and services during the war, which officers of the Quartermaster's Department failed to settle because of want of funds, non-presentation, or because they had not authority to settle them, or believed them to be unjust, or not well proved.

While the amount is large, it is but a small portion of a business exceeding \$1,200,000,000, expended under the direction of this office during the war and in consequence of its operations.

The action upon these claims during the fiscal year ending 30th June, 1871, has been settlement of 846 claims, for \$232,511 68, by allowance of \$229,693 54; rejection of 197 claims, for \$53,548 36.

There remain on file, for future decision, 14,585, amounting, as presented, to \$7,457,183 82.

Claims and accounts on account of transportation.

On 1st July, 1870, there were on file in this office—

One thousand one hundred and sixty-two claims and accounts relative to transportation, amounting to.....	\$1,244,788 65
One hundred and seventy-one accounts for.....	802,983 13
Four hundred and sixty-three claims for.....	8,394,963 72

were received and filed during the fiscal year. Total presented 1,796, amounting to	10,442,935 50
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During the fiscal year there were referred for settlement—

Five hundred and twenty-two claims, for.....	\$1,237,014 14
Eight hundred and ten accounts.....	509,502 15
Total	1,746,516 29

There were transferred to the other bureaus to which they properly pertained—

Twenty-eight, amounting to	\$7,353 04
There were rejected one hundred and ninety-three claims, amounting to	6,860,881 31
There were suspended, at close of the year, ten, amounting to	5,111 62
The total number thus settled, suspended, or rejected, was 1,563, amounting to.....	8,619,262 96

At the close of the year there remained awaiting action two hundred and thirty-three of these transportation claims and accounts, amounting to \$1,822,793 20.

Among the heavy claims rejected during the year were claims from railroads captured and used by the Army for military purposes, for use or destruction of the roads, and bridges, and other property, viz:

By Nashville and Chattanooga Railroad.....	\$4, 557, 092 64
Nashville and Northwestern Railroad.....	848, 140 69

Total.....	5, 405, 233 33
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The following have also, since the termination of the year, been returned to the Third Auditor, with report that they should be rejected:

East Tennessee and Virginia Railroad.....	\$751, 200 67
East Tennessee and Georgia Railroad.....	765, 912 33

Total.....	1, 517, 113 00
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A claim for services of steamer John Faron, during the war, amounting to \$511,000, is also among those rejected during the year.

In view of the very large interests of citizens and of the Government in the business and values represented in these claims, I call attention to the fact that all the evidence for and against them remains in this office until acted upon here, and that then only the papers relating to those which have been referred to the Treasury for allowance are removed to the Treasury Building, where they are safe. The rest remain in this office, exposed to destruction at any moment by fire, for, from the construction of this building it would be impossible to save the building and its contents if a fire once gained headway within its walls.

NATIONAL MILITARY CEMETERIES.

There are 72 national military cemeteries in charge of this Department, to which should be added the cemeteries of Antietam and Gettysburgh, in the construction and establishment of which this Department bore a part, making in all 74 national military cemeteries. In these are interred 303,536 soldiers, who perished during the war.

In 316 private and post cemeteries are interred the remains of 14,314 others, well cared for, and whose rest it has been thought best not to disturb by removal to national cemeteries.

The total number cared for by the United States thus far is 317,850.

During the fiscal year the graves of 2,295 soldiers, not before discovered, have been reported to this office; and the remains have been removed to national cemeteries.

The grounds have been well cared for. Some of the cemeteries are very beautiful, and are much resorted to by the public. They occupy about 1,800 acres of land, much of which is now the property of the United States, acquired under the acts of 28th July, 1866, 22d February, 1867, and joint resolution of 13th April, 1866, at a total cost for the fee simple of about \$170,000.

A schedule, herewith, gives names of cemeteries, of former owners, and of prices paid for the sites.

The expenditure incurred in collecting the dead into national cemeteries, out of the general appropriations of the Quartermaster's Department, before Congress passed laws recognizing and establishing national cemeteries, and prescribing the mode of acquiring possession and title, and of inclosing and maintaining them, was \$2,446,882 94.

The following appropriations have been made by Congress for national cemeteries, viz:

By act of Congress of July 28, 1866.....	\$50, 000 00
By act of Congress of February 22, 1867.....	750, 000 00

By act of Congress of March 3, 1869.....	\$600,000 00
By act of Congress of July 15, 1870	300,000 00
Total.....	<u>1,700,000 00</u>
Part of appropriation under act of March 3, 1869, returned to surplus fund, by act of July 12, 1870, section 5.....	\$146,576 68
Total amount of appropriations for national cemeteries, expended....	\$1,553,423 32
Total amount of general appropriations expended on cemeteries	<u>2,446,882 94</u>
Total expenditure in gathering the dead into, and in establishing and maintaining military cemeteries.....	<u>4,000,306 26</u>

During the fiscal year ending June 30, 1871, the entire appropriation for the year, (by act of Congress of July 15, 1870,) \$300,000, was expended.

The appropriation for the current year is not sufficient for the work which should now be in progress. The law requires every cemetery to be surrounded by a wall or an iron railing, and every grave to be marked by some permanent monument.

The cemeteries, when first laid out, were surrounded by wooden fences, and the graves marked by wooden head-boards. As these decayed, walls or railings have been erected, and hedges have been planted; but the wooden head-boards have not yet been replaced by permanent marks. Advertisements issued in November, 1866, showed that a permanent head-block for every grave, bearing an inscription in raised letters, giving number, name, rank, regiment, and company, and date of death of occupant of each grave, could be procured for about \$1 15, but the Secretary of War, to whom the bids were submitted, did not then authorize the work to be undertaken, and the wooden head-boards have been set up as they fell from decay, or have been replaced by numbered stakes, while awaiting the execution of the law of February 22, 1867. (Statutes at Large, volume 14, page 399, section 2.)

The following cemeteries had been permanently inclosed before June 30, 1870, with stone walls: Chattanooga, Fort Donelson, Pittsburgh Landing, Tennessee; Mill Springs, Camp Nelson, and Lebanon, Kentucky; New Albany, Indiana; Little Rock, Arkansas; and that of San Antonio, Texas.

With brick walls: Mobile, Alabama, and Barrancas, Florida.

With iron railings: Loudon Park, Baltimore, Maryland, and two sides of the Chalmette Cemetery, New Orleans, Louisiana.

During the fiscal year stone walls have been erected or begun at Soldiers' Home and Battle Cemeteries, District of Columbia; at Arlington, Alexandria, Ball's Bluff, Hampton, Petersburg, Richmond, Winchester, and Yorktown, Virginia; at Annapolis, Maryland; New Berne and Wilmington, North Carolina, and at Jefferson Barracks, Missouri.

A brick wall at the Cold Harbor Cemetery, Virginia, and iron railings at Keokuk, Iowa, Rock Island, Illinois, and on the roadside of the Soldiers' Home Cemetery, District of Columbia.

Some of these walls were erected without coping, it being the intention to secure as many permanent inclosures as possible with the funds appropriated, and to provide coping from future appropriations. But the Secretary of War having decided that it was better to cope all the walls as erected, coping is now being provided for those not thus furnished when first built.

A handsome arched gateway to the Arlington Cemetery is in progress

Hedges, generally of Osage orange, have been planted during the year in most of the national cemeteries.

Thirty-five cemeteries still need permanent inclosures. They are: Alexandria, Baton Rouge, and Port Hudson, Louisiana; Andersonville and Marietta, Georgia; Beaufort and Florence, South Carolina; Salisbury and Raleigh, North Carolina; City Point, Culpeper Court-House, Danville, Fort Harrison, Fredericksburg, Glendale, Seven Pines, and Staunton, Virginia; Grafton, West Virginia; Beverly, New Jersey; Mound City and Camp Butler, Illinois; Nashville, Murfreesborough, Knoxville, and Memphis, Tennessee; Fort Leavenworth and Fort Scott, Kansas; Jefferson City and Springfield, Missouri; Corinth, Natchez, and Vicksburg, Mississippi; Fayetteville, Arkansas; Fort Gibson, Indian Territory; and Brownsville, Texas.

Seventeen permanent stone or brick lodges had been erected before June 30, 1870, at the following cemeteries, viz: Richmond, Virginia; Salisbury, North Carolina; Beaufort and Florence, South Carolina; Marietta, Georgia; Barrancas, Florida; Natchez and Vicksburgh, Mississippi; Chalmette, Louisiana; San Antonio, Texas; Mound City and Camp Butler, Illinois; Jefferson Barracks, Missouri; Fort Leavenworth, Kansas; Fort Smith and Little Rock, Arkansas; and Keokuk, Iowa.

During the fiscal year seventeen permanent lodges have been built or commenced: Stone lodges at Soldiers' Home and Battle, District of Columbia; Alexandria, City Point, Cold Harbor, Fredericksburgh, Fort Harrison, Hampton, Petersburg, Staunton, Winchester, and Yorktown, Virginia; New Berne and Wilmington, North Carolina; and brick lodges at Annapolis, Maryland; Cypress Hill, New York; and New Albany, Indiana.

Twenty-seven cemeteries are still without lodges, some of which will be constructed during the current year. Those not provided on June 30, 1871, were: Alexandria, Baton Rouge, and Port Hudson, Louisiana; Andersonville, Georgia; Raleigh, North Carolina; Culpeper Court-House, Danville, Glendale, and Seven Pines, Virginia; Grafton, West Virginia; Camp Nelson, Mill Springs, and Lebanon, Kentucky; Chattanooga, Knoxville, Memphis, Murfreesborough, Nashville, Fort Donelson, and Shiloh, Tennessee; Corinth, Mississippi; Fayetteville, Arkansas; Fort Gibson, Indian Territory; Fort Scott, Kansas; Jefferson City and Springfield, Missouri; and Brownsville, Texas.

With the \$20,000 which the appropriation bill of July 15, 1870, directed to be expended in planting the national cemeteries, 120,000 feet of hedge and 28,200 evergreen and deciduous trees and shrubs have been set out. About fourteen thousand more will be planted this fall. They are generally doing well, and will much improve the appearance of the cemeteries when grown.

The twenty-sixth volume of the Roll of Honor is just being distributed.

There are fifty-seven superintendents of national cemeteries in service, and four vacancies exist. These superintendents are, by law, appointed by the Secretary of War, the appointees being in all cases selected from "enlisted men of the Army disabled in service."

With this report are tables giving detailed information as to the work upon and condition of the several cemeteries.

POST CEMETERIES.

The act of July 20, 1868, and March 18, 1870, requiring sale of the ground at Fort Gratiot, Michigan, occupied as a post cemetery, the re-

mains of about one hundred and fifty-one officers and soldiers have been removed to the Port Huron City Cemetery.

The post cemetery at Fort Larned, Kansas, has been reduced to about two hundred and fifty feet square, and remains of all buried near the post have been collected in this plot, which has been inclosed by a new fence.

Carlisle Barracks having been ordered abandoned as a military post, arrangements have been made to remove the bodies from the post cemetery, and to reinter them in lots owned by the United States in the Ashland Cemetery, where, it is hoped, it will not be necessary again to disturb them.

There have been received in the branch of this office which has charge of reports, of inspections, boards of survey, orders and documents, 106,500 documents, of which 91,450 have been distributed to officers and others entitled to receive them. This in addition to a large personal official correspondence.

The official history of officers connected with the quartermasters' services is carefully recorded and preserved.

Lists of officers of the Quartermaster's Department and of those line officers who have, during the year, been on duty as acting assistant quartermasters, with their stations, accompany this report.

A change was made in the officers on duty in this office shortly before the beginning of the fiscal year. Those who had been here assisting the Quartermaster General during the war, and who had remained till the opening of 1870, were ordered to distant posts, to take their turn in the remoter fields of duty, and were replaced by Colonel Robert Allen, assistant quartermaster general, from the Pacific coast, who has charge of reports of inspection and boards of survey relating to the Quartermaster's Department, of general and special orders pertaining to this office, and of estimates for funds.

Major J. D. Bingham, quartermaster, from the Department of the Lakes, now in charge of clothing, camp and garrison equipage of the Army; also in charge of the examination and analysis of the money accounts of officers making and rendering returns of public money received, expended, transferred, and remaining on hand on account of the Quartermaster's Department; of accounts of officers for quartermasters' property, clothing, camp and garrison equipage received, issued, expended, and remaining on hand; and of the transmission of said accounts to the proper accounting officers of the Treasury; and of all business connected with cemeteries, and of all claims presented for supplies and services connected therewith.

Major M. I. Ludington, quartermaster, from New Mexico, who has charge of supplies, regular and miscellaneous, (excepting clothing, camp and garrison equipage,) of the transportation of the Army and of its supplies, and of all claims growing out of such service and supplies; of all duties pertaining to railroad and telegraph lines which have been operated by the United States, and of collections from indebted railroad companies; of arrears due the United States by said companies on account of the purchase, at the close of the war, of railroad property; also, of the ordinary business of the office connected with barracks, quarters, hospital buildings, store-houses, stables, and bridges, and of all claims for supplies and services connected therewith, and of all claims for incidental allowances, and also of the records of the office.

I am indebted to these officers, as to their predecessors, for efficient and valuable assistance in the work of the Department.

The most important posts of the Quartermaster's Department, outside

of this office, have been the positions of chief quartermasters of divisions, of general depots, and of departments.

Colonel D. H. Rucker has been on duty as chief quartermaster Division of the Missouri, Chicago, Illinois.

Colonel Rufus Ingalls has been chief quartermaster Department of the East, and in charge of general depot of the Quartermaster's Department at New York City.

Lieutenant Colonel L. C. Easton, chief quartermaster Department of the Missouri, St. Louis, and afterward at Fort Leavenworth.

Lieutenant Colonel S. Van Vliet, chief quartermaster Military Division of the Atlantic, and in charge of depot and Schuylkill Arsenal, Philadelphia, Pennsylvania.

Lieutenant Colonel J. C. McFerran, chief quartermaster Military Division of the South, Louisville, Kentucky.

Lieutenant Colonel S. B. Holabird, chief quartermaster Department of Dakota, St. Paul, Minnesota.

Lieutenant Colonel R. O. Tyler, chief quartermaster Military Division of the Pacific, San Francisco, California.

Lieutenant Colonel C. H. Tompkins, after the Department of Alaska was broken up, was assigned to duty as chief quartermaster Department of Arizona, and stationed at Drum Barracks, California, from December 25, 1870.

Lieutenant Colonel J. A. Ekin, chief quartermaster Department of Texas, San Antonio.

Major H. C. Ransom, chief quartermaster Department of Montana, at Fort Shaw.

Major A. R. Eddy, chief quartermaster Department of the South, Louisville, Kentucky.

Major Rufus Saxton, chief quartermaster Department of the Columbia, Portland, Oregon.

Major A. J. Perry, chief quartermaster Department of the Platte, Omaha, Nebraska.

Major H. C. Hodges, Schuylkill Arsenal, and chief quartermaster third district, Department of the East, Philadelphia.

Major C. G. Sawtelle, chief quartermaster Department of California, San Francisco.

Major J. J. Dana, chief quartermaster Department of the Lakes, Detroit, Michigan.

Major J. M. Moore, in charge of division depot at Fort Leavenworth, Kansas.

Captain William Myers, in charge of depot at Washington, District of Columbia.

Captain B. C. Card, in charge of depot at San Antonio, Texas.

Captain C. H. Hoyt, in charge of general depot at Jeffersonville, Indiana.

Captain J. F. Rodgers, military storekeeper at Jeffersonville, Indiana.

Captain V. P. Van Antwerp, military storekeeper, in charge of Schuylkill Arsenal, Philadelphia, Pennsylvania.

REGULATIONS.

During the year, with advice of a board of officers of experience in the Quartermaster's Department, the regulations of the Quartermaster's Department have been carefully revised; the forms of returns and accounts and reports simplified, and made to conform to the orders and instructions and laws published since the regulations of 1863 were issued.

The general scheme of accountability for money and property in the Quartermaster's Department is simple, and has borne the test of service in a great war. Claims from citizens, inquiries from committees of Congress in relation to property purchased or taken by the Army, and to the application of the public funds during the war, are received in great numbers; and information to support just claims, to defeat those which are unjust, and to answer all reasonable inquiries, is generally found on record.

Believing that the system which has stood this test is sound and good, it has not been thought well to make considerable change in it.

The number of printed forms is large, but it is cheaper to print one distinct form for every common case than to spend time and clerk-hire in writing out the formal terms of bills, and receipts, and reports. Full instructions as to the cases in which each blank is to be used, and what is to be done with it when used, should be printed on the back of the blank form itself, and this, which is a great aid to the inexperienced officer who finds himself for the first time called upon to act as acting assistant quartermaster, to open accounts, and bear responsibility for Government moneys and property, has been provided for in this scheme of revised regulations, submitted to the Secretary of War on the 13th January last.

There is no effectual mode of preventing waste and extravagance, or of detecting and punishing them when committed, without a complete and detailed prescribed system of accounts for money and of returns and accounts for property intrusted to officers. Such a system is sometimes denounced as interfering with free and quick action, but it has not been found in honest and reliable hands incompatible with supply and support of a very large army, very quickly raised and organized, and without it this Army would have suffered, perhaps dissolved, for want of supplies regularly provided and delivered at every point of need.

It is not probable that the same vast amount of money was ever disbursed and applied to the purposes for which it was granted with so little loss by dishonesty or waste as during the late great war.

Men, hastily appointed from all occupations of civil life, found themselves suddenly placed in charge of vast sums of money and of great quantities of valuable property, and, by the simple system adopted by the Army regulations, they were able to bear their responsibility, and to apply the money and the supplies to the proper use, and to make such accounts of their responsibility as to save themselves from loss and from suspicion.

SITES FOR POSTS IN TEXAS.

Owing to the property in all public lands of Texas being in the State and not in the United States, and to the restrictions imposed upon the War Department by the law of May 1, 1820, Statutes at Large, volume 3, chapter 52, section 7, page 568, which forbids the purchase of any lands for use of the United States without a special law authorizing it, most of the military posts in Texas have been established upon lands to which the United States has no title.

These posts have generally been located far in advance of any settlement, and, when located, there has probably been generally no knowledge of the condition of the title, whether in the State, or taken up and entered under State laws by individuals.

Such lands, until occupied and protected, have generally had very little value. Probably twenty-five cents per acre would be a large

price for lands in the vicinity of most of the frontier posts in Texas, even after protection was assured by their occupation by troops of the United States; but the moment the United States begins to build shelter for the troops, the lands are, if the property of the State, entered by some citizen, or, if the property of an unlettered person, purchased by some man of business, who sees in them, occupied and improved by the United States, a prospect of great improvement in value and the foundation of a claim for rent or sale.

The War Department, in the present state of the law, is helpless in this matter. If the demands of those who hold title are extravagant, it has generally thus far declined to pay rent. It is prohibited by law from purchasing.

Some of the sites in Texas have a certain value as containing springs of water, which in some parts of that State are well-known stopping-places for traders, and travelers, and for warriors; and these springs are gradually being taken up and made private property at prices probably not exceeding twenty-five or fifty cents per acre for the land which must be entered in order to control them. Without the use of these springs, very large tracts in the neighborhood are valueless, indeed uninhabitable.

I recommend that the attention of Congress be called to this subject, and that the Secretary of War be clothed with authority to purchase the sites of such military posts as are already or as may be within a few years established in Texas, at prices which he may determine to be just and reasonable, considering the value of the land before its occupation by the United States.

I see no other mode of settling a very disputed and important question.

If this authority is granted, a moderate appropriation should be made to pay for the land.

The sites, when occupied by the United States, had little intrinsic value. Their present value depends in a great degree upon the improvements made by the United States for the protection of the State and its inhabitants.

The reports of officers on duty in this office, which are herewith, and the accompanying tables, are referred to for information in detail upon the several subjects of this report.

Respectfully submitted.

M. C. MEIGS,

Quartermaster General, Brevet Major General, U. S. A.

Hon. WM. W. BELKNAP, *Secretary of War.*

List of papers accompanying the annual report of the Quartermaster General for the fiscal year ending June 30, 1871.

- 1.—Report of Colonel Robert Allen, assistant quartermaster general, U. S. A., of the operations of the inspection branch of the Quartermaster General's Office, during the fiscal year ending June 30, 1871.

Accompanying papers:

- A.—List of officers on duty in the Quartermaster's Department during the fiscal year, including officers of the line on duty as acting assistant quartermasters.
- B.—Report of the stations and duties of officers of the Quartermaster's Department on July 1, 1871.
- 2.—Report of Major J. D. Bingham, quartermaster, U. S. A., of the operations of the accounting branch of the Quartermaster General's Office during the fiscal year ending June 30, 1871.
- 3.—Report of Major J. D. Bingham, quartermaster, U. S. A., of the operations of the clothing branch of the Quartermaster General's Office during the fiscal year ending June 30, 1871.

Accompanying papers:

- A.—Statement showing the quantity of clothing, camp and garrison equipage, and clothing materials in the hands of officers June 30, 1870, the quantity purchased, manufactured, sold, lost, and issued during the fiscal year, and quantity on hand June 30, 1871.
- B.—Statement showing expenditures on account of clothing, camp and garrison equipage and materials, at the principal depots, during the fiscal year.
- C.—Statement of amounts received from sales of clothing, camp and garrison equipage and materials, during the fiscal year.
- D.—Statement of claims for property purchased and seized for the use of the Army, received and acted upon in the clothing and equipage branch of the Quartermaster General's Office during the fiscal year.
- E.—Statement of returns of clothing, camp and garrison equipage received, examined, and transmitted to the Treasury Department, and of letters received and written during the fiscal year.
- 4.—Report of Major J. D. Bingham, quartermaster, U. S. A., of the operations of the cemeterial branch of the Quartermaster General's Office during the fiscal year ending June 30, 1871.

Accompanying papers:

- A.—Tabular statement of permanent improvements on national cemeteries.
- B.—Tabular record of titles to land occupied by United States for national cemeteries.
- C.—Consolidated report of work accomplished on national cemeteries prior to and during the fiscal year.
- D.—Schedule of "rolls of honor" and statements of final disposition of bodies, published by the Quartermaster General.
- E.—Brief sketches of national cemeteries.
- 5.—Report of Major M. I. Ludington, quartermaster, U. S. A., of the operations of the regular supplies, transportation, and barracks and quarters branch of the Quartermaster General's Office, during the fiscal year ending June 30, 1871.

Accompanying papers:

- A.—Statement of public funds in possession of Major M. I. Ludington during the fiscal year.
- B.—Statement of the indebtedness of southern railroad companies for railway material for the fiscal year.
- C.—Abstract of contracts for wagon transportation entered into by the Quartermaster's Department during the fiscal year.
- D.—Statement of vessels chartered, impressed, and employed during the fiscal year.
- E.—Statement of vessels owned or purchased by the Quartermaster's Department during the fiscal year.
- F.—Abstract of contracts for water transportation during the fiscal year.
- G.—Statement of all troops and stores transported under direction of the Quartermaster's Department during the fiscal year.
- H.—Statement of amounts paid on account of rail, river, stage, and wagon transportation by the Quartermaster's Department during the fiscal year.
- I.—Statement of accounts and claims on account of transportation for the fiscal year.
- K.—Statement of miscellaneous claims filed and acted upon during the fiscal year.
- L.—Statement of claims filed under the act of July 4, 1864, during the fiscal year.
- M.—General statement of claims and accounts for the fiscal year.
- N.—Statement of miscellaneous claims filed since the commencement of the war.
- O.—Statement of claims filed in the Quartermaster General's Office, under the act of July 4, 1864.

QUARTERMASTER GENERAL'S OFFICE,
Washington, D. C., July 13, 1871.

GENERAL: I have the honor herewith to submit a report of the operations of the inspection branch of this office during the fiscal year ending June 30, 1871.

The principal duties of this branch may be defined as follows:

I. Continuation of narrative records, showing successive stations and duties, not only of the regular officers of the Department, but also of all the officers assigned to duty therein.

II. Keeping a station-book, arranged alphabetically by stations, showing the successive officers on duty at each depot and post.

III. Preparing for such action as may be requisite boards of survey, annual reports, communications relative to assignments of officers, and

those concerning miscellaneous subjects not specially assigned to other branches of the office.

IV. Filing and distributing orders and circulars.

V. Preparing monthly return of officers of the Quartermaster's Department for the Adjutant General's Office.

VI. Preparing for action all papers relative to the distribution of civilian employes in the several military divisions and departments.

VII. Keeping books of letters received and letters sent pertaining to officers, agents, and employes in their individual capacities.

The monthly return of officers for 1861 and 1862 has been, during the fiscal year, completed and furnished to the Adjutant General of the Army; that for 1863 is nearly finished, as is the draught for that of 1864. These, with the same for the earlier months of 1865, which require revision, will complete those returns for back years. The non- rendition of personal reports by two officers of this Department for five and eight months, respectively, has, however, prevented the returns being furnished to the Adjutant General's Office since October, 1870.

A book, in which the stations are alphabetically arranged and the officers at each specified in chronological order, from January 1, 1868, onward, in continuance of a similar book from January 1, 1861, to December 31, 1867, is now being compiled.

The following is an approximate statement of the number of orders and circulars received and distributed by this branch during the past fiscal year:

	Rec'd.	Dist'd.
General Orders, Quartermaster General's Office.....	500	9,200
General Orders, Adjutant General's Office.....	77,700	62,500
General Court-Martial Orders, Adjutant General's Office.....	18,700	12,000
Circulars.....	5,600	4,100
Rolls of honor.....	2,000	2,150
Miscellaneous.....	2,000	1,500
	<u>106,500</u>	<u>91,450</u>

During the first half of the fiscal year, 706 inventory and inspection reports, 118 reports of boards of survey, and 503 communications pertaining to other business of the branch have been received, recorded, examined, and submitted for the requisite action; 782 letters have been written, and indorsements made, during the same period.

These estimates are exclusive of personal and annual reports, correspondence pertaining to the receipt and distribution of orders, &c.

During the latter half of the fiscal year, about 636 inventory and inspection reports have been examined, 1,686 entries made of letters received, 221 letters written, and indorsements made, which are recorded in this branch, exclusive of several hundred recorded elsewhere.

During the second period, however, the preceding figures are not necessarily indicative of the business transacted.

On November 16, 1870, the War Department ordered the books of this office to be kept, from and after January 1, 1871, in accordance with "Instructions for keeping the records and transacting the clerical business of the War Department," comprised in a pamphlet so entitled, in which "letters received" and "letters sent" are divided into six classes, and entered, according to the subject, in as many different books. The books of "officers, agents, and employes" are kept in this branch, to which nearly all the papers therein entered appertain. But the majority of the more important papers here acted upon are entered, and the action taken recorded in the "general and miscellaneous" book, probably more

than two-thirds of the letters written in this branch being recorded elsewhere. Reports of inspection and of special investigation, inventory and inspection reports of property, boards of survey, annual reports, communications relating to the receipt and distribution of orders and circulars, and the apportionment of employes, must all be entered in the "general and miscellaneous" book, though all the action on such papers is taken in this branch, and, for the most part, has been since the organization of the inspection division in 1864. Of such action, taken years ago, this branch is frequently called upon for information, and is liable to be so called on years hence for similar action taken at the present time. From the outset special attention has been paid to keeping the record of such action easily accessible by means of indices, &c. But from and after January 1, 1871, this branch has had no means of keeping any systematic record of such action, unless by memorandum-books, the accumulation of which is objectionable and intrinsically unnecessary. It is self-evident that neither officers nor clerks can justly be held responsible, either for promptness or accuracy, when obliged to depend upon records kept elsewhere, however efficiently, and in books wherein the papers acted upon in this branch are far outnumbered by other papers. The clerks in this branch, accustomed for years to answer certain classes of inquiries, naturally keep their books so indexed and arranged as to facilitate response. The importance of so doing can best be realized by those practically cognizant of the loss of time and perplexity already experienced in some degree from present arrangements, so that in many cases action can be more easily traced back six years than six months. These impediments must largely increase with time, as memory and pigeon-holes rapidly diminish in availability. To the new *method* itself no objection is entertained. For years past the books of this branch have been so indexed as to virtually anticipate its requirements in that important particular. But the division of *subjects* must inevitably result in delay and confusion, increasing with the lapse of years.

But far greater are the present inconveniences experienced from this source in the finance branch, (estimates of funds,) of which I am also in charge; all the transactions of the latter having to be recorded in the accounts branch, located two stories below, thus involving the necessity of ascending and descending two stairways several times daily. It is estimated that at least one hour daily is thus uselessly expended by reason of the finance branch not being permitted to keep its own records, besides the indirect detriment to the service, which must necessarily result from having one set of clerks to transact the business and another to keep the books in which the transactions are recorded. Were each branch to have charge of its own records, it is evident that business would be facilitated, time economized, and accuracy insured.

I respectfully inclose herewith lists of officers on duty in the Quartermaster's Department during the fiscal year, including acting assistant quartermasters, and comprising a general outline of their respective duties; also stations and duties of officers of the Quartermaster's Department on July 1, 1871.

Very respectfully, your obedient servant,

ROBERT ALLEN,

Assistant Quartermaster General

Brigadier General M. C. MEIGS,

Quartermaster General, Washington, D. C.

A.—Annual report of officers on duty as acting assistant quartermasters during the fiscal year ending June 30, 1871, comprising the time during which and the stations at which they have so served.

Name.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Abbott, Asa T.	2d Lt. 3d Art.	1st Lt.	Fort Jefferson, Fla.	July 1, 1870, to May 25, 1871.
Abbott, L. A.	1st Lt. 6th Cav.		Fort Richardson, Tex.	July 1 to Nov. 30, 1870.
			Fort Riley, Kans.	May 11 to June 30, 1871.
Aldrich, Bishop.	1st Lt. & R. Q. M. 8th Inf.		Columbia, S. C.	July 1 to Oct. 20, 1870.
			David's Island, New York Harbor.	Nov. 5, 1870, to June 30, 1871.
Allanson, John S.	1st Lt. 20th Inf.		Fort Wadsworth, Dak.	Aug. 15 to Oct. 1, 1870.
Allyn, A. W.	Capt. 16th Inf.	Major.	Covington, Ga.	Dec. — to Dec. 31, 1870.
Almy, Jacob.	1st Lt. 5th Cav.		Sidney, Nebr.	Sept. 26 to Nov. 19, 1870.
Ames, L. S.	2d Lt. 2d Inf.		Livingston, Ala.	Oct. 26 to Nov. —, 1870.
Anderson, John.	2d Lt. 18th Inf.		Columbia, S. C.	Oct. —, 1870, to June 30, 1871.
Andrus, E. Van A.	1st Lt. 1st Art.	Capt.	Fort Riley, Kans.	Aug. 31, 1870, to M'ch. 14, 1871.
Armstrong, R. G.	2d Lt. 1st Inf.		Ft. Porter, Buffalo, N. Y.	May 20 to June 30, 1871.
Arthur, William.	1st Lt. 3d Art.	Major.	White Rock Cr'k, Kans.	Aug. 31 to Sept. 13, 1870.
Ashbury, George.	1st Lt. 5th Art.		Fort Niagara, N. Y.	July 1, 1870, to May 4, 1871.
Atwood, E. B.	2d Lt. 6th Inf.	Major.	Camp at Cheyenne and Arapahoe Ag'y, Idaho	April 1 to April 30, 1871.
			Camp Douglas, Utah.	Nov. 8 to Dec. 19, 1870, and Feb. 1 to May 31, 1871.
Auman, William.	1st Lt. & R. Q. M. 13th Inf.		Fort Sedgwick, Colo.	March 15 to June 6, 1871.
Austin, Albert.	2d Lt. 14th Inf.		Sidney Barracks, Nebr.	June 17 to June 30, 1871.
Babcock, John B.	1st Lt. 5th Cav.	Major.	North Platte, Nebr.	Nov. 9, 1870, to Jan. 31, 1871.
Bacon, George R.	2d Lt. 1st Cav.		Camp Grant, Ariz.	July 1, 1870, to Jan. 24, 1871.
Badger, N. D.	1st Lt. 23d Inf.	Captain.	Whetstone Ag'y, Dak.	April 24 to June 30, 1871.
Bailey, Ed. L.	2d Lt. 4th Inf.	Lt. Col.	Paducah, Ky.	March 27 to June 30, 1871.
Baldwin, F. D.	1st Lt. 5th Inf.		Fort Hayes, Kans.	July 1 to Oct. 1, 1870.
Baldwin, James H.	1st Lt. & R. Q. M. 18th Inf.		Atlanta, Ga.	July 1, 1870, to June 30, 1871.
Ball, Edward.	Capt. 2d Cav.		Fort Ellis, Mont.	July 1, 1870, to June 30, 1871.
Barnett, E. A.	1st Lt. & R. Q. M. 4th Art.	Captain.	Fort McHenry, Md.	July 1, 1870, to June 30, 1871.
			Baltimore, Md.	July 1 to Sept. 28, 1870.
Bandy, William M.	2d Lt. 19th Inf.		Baton Rouge, La.	July 1 to Oct. 8, 1870, and Dec. 10, 1870, to May 13, 1871.
Barrett, Gregory, jr.	1st Lt. & R. Q. M. 10th Inf.		Fort Brown, Tex.	July 1, 1870, to June 30, 1871.
Barrett, W. W.	1st Lt. 16th Inf.	Lt. Col.	Natchez, Miss.	July 1 to Sept. —, 1870.
Bateman, John C.	2d Lt. 2d Inf.		Greensborough, Ga.	Dec. — to Dec. —, 1870.
Bates, R. F.	2d Lt. 18th Inf.	1st Lt.	Chester, S. C.	April 12 to June 30, 1871.
Bean, John W.	2d Lt. 15th Inf.	Captain.	Fort Garland, Colo.	July 1 to Dec. 31, 1870.
Beil, James M.	1st Lt. & R. Q. M. 7th Cav.	Major.	Ft. Leavenworth, Kans.	July 1 to Sept. 2, and Nov. 5 to Dec. 30, 1870.
Bendire, Charles.	1st Lt. 1st Cav.		Fort Lapwai, Idaho.	July 1 to Dec. 31, 1870.
Bennett, A. S.	Capt. U. S. A.		Waco, Tex.	July 1 to Aug. 23, 1870.
Bennett, C. E.	Capt. 17th Inf.		Grand River Ag'y, Dak.	April 17 to June 30, 1871.
Benson, H. M.	1st Lt. 7th Inf.		Camp Baker, Mont.	July 1, 1870, to April 18, 1871, and May 30 to June 30, 1871.
Bernard, R. F.	Capt. 1st Cav.	Colonel.	Camp Bidwell, Cal.	May 27 to June 30, 1871.
Bird, Charles.	1st Lt. 23d Inf.	Lt. Col.	Camp San Juan Island, Wash.	July 1, 1870, to June 30, 1871.
Bisbee, William H.	Capt. U. S. A.		Omaha Barracks, Nebr.	July 23 to Aug. 23, 1870.
Bishop, John S.	2d Lt. 13th Inf.		Fort Rawlins, Utah.	Aug. 11, 1870, to Mar. 4, 1871.
Bonsall, S. W.	1st Lt. 3d Inf.		Fort Lyon, Colo.	July 1, 1870, to June 30, 1871.
Boswell, B. D.	2d Lt. 11th Inf.	Captain.	Jefferson, Tex.	Jan. 1 to June 30, 1871.
Boutelle, F. A.	2d Lt. 1st Cav.		Camp Warner, Oreg.	Dec. 1, 1870, to April 30, 1871.
Bower, William H.	2d Lt. 14th Inf.		Camp Stambaugh, Wyo.	Feb. 13 to April 5, 1871.
Bowman, A. H.	1st Lt. 9th Inf.		North Platte, Nebr.	July 1 to Sept. 17, 1870.
Boyd, O. B.	1st Lt. 8th Cav.		Fort Stanton, N. Mex.	Jan. 30 to June 30, 1871.
Braden, Charles.	2d Lt. 7th Cav.		Camp near River Bend, Colo.	July 1 to Nov. 30, 1870.
Bradford, R. E.	1st Lt. 15th Inf.		Winnaborough, S. C.	June 10 to June 30, 1871.
			Fort Craig, N. Mex.	July 1 to Sept. 30, 1870.
Bradley, J. H.	1st Lt. 18th Inf.		Fort McKee, N. Mex.	Dec. 15, 1870, to June 30, 1871.
Brinckle, John R.	1st Lt. 5th Art.	Major.	Darien, Ga.	July 1 to July 20, 1870.
Britton, Thomas.	1st Lt. 6th Inf.	Captain.	Fort Warren, Mass.	July 1, 1870, to June 30, 1871.
			Camp at Cheyenne & Arapahoe Ag'y, I. T.	July 13, 1870, to Jan. 31, 1871.
Brodie, A. O.	2d Lt. 1st Cav.		Camp Thomas, Ariz.	Jan. 18 to Feb. 2, 1871; Feb. 2 to June 30, 1871.
			changed to Camp Apache, Ariz.	
Brodrick, P. T.	2d Lt. 23d Inf.		Fort Colville, Wyo.	July 1 to Dec. 13, 1870.
Brown, A. B.	1st Lt. 1st Inf.	Captain.	Fort Wilkins, Mich.	July 1 to Aug. 30, 1870.
			Fort Wayne, Mich.	Jan. 13 to April 19, 1871.
Brown, Rufus P.	2d Lt. 4th Inf.		Lexington, Ky.	April 1 to June 30, 1871.
Bubb, John W.	1st Lt. 4th Inf.		Fort Sanders, Wyo.	July 1, 1870, to Mar. 17, 1871.
Buffum, M. P.	1st Lt. 15th Inf.	Major.	Fort McKee, N. Mex.	July 1, 1870, to Dec. 15, 1870.
			Fort Craig, N. Mex.	April 20 to June 30, 1871.
Burnett, L. F.	2d Lt. 7th Inf.	Captain.	Fort Benton, Mont.	July 1, 1870, to June 30, 1871.
Burna, Wm.	1st Lt. 17th Inf.	Captain.	Cheyenne Ag'y, Dak.	July 1 to Oct. 31, 1870.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Name.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Calhoun, James	2d Lt. 7th Cav.		Bagdad, Ky.	Mar. 24 to May 6, 1871.
Callahan, C. M.	1st Lt. 3d Art.	Captain	Savannah, Ga.	July 1, 1870, to May 30, 1871.
Callinan, D. F.	1st Lt. 1st Inf.		Fort Brady, Mich.	July 1, 1870, to June 30, 1871.
Camp, E. M.	1st Lt. 12th Inf.	Captain.	Angel Island, Cal.	April 14 to June 30, 1871.
Campbell, C. E.	2d Lt. 3d Inf.		Fort Larned, Kans.	Oct. 1, 1870, to June 30, 1871.
Campbell, John A.	2d Lt. 2d Art.		Fort Kodiak, Alaska.	July 1 to Aug. 31, 1870.
Campbell, L. E.	1st Lt. 22d Inf.		Whetstone Agency, Dak.	Dec. 4, 1870, to Mar. —, 1871.
Campbell, Quentin.	2d Lt. 5th Inf.		Fort Wallace, Kans.	July 1, 1870, to April 27, 1871.
Carland, John.	1st Lt. & R. Q. M. 6th Inf.		Fort Scott, Kans.	July 1 to Aug. 28, 1870.
Carolin, Denis	1st Lt. 19th Inf.		Fort Gibson, Ind. T.	Sept. 24, 1870, to June 30, 1871.
Carr, C. C. C.	Capt. 1st Cav.		Shreveport, La.	July 1 to Oct. 31, 1870.
Catley, Henry.	1st Lt. 2d Inf.		Camp Winfield Scott, Nev.	July 1 to July 31, 1870.
Cavanaugh, H. G.	2d Lt. 13th Inf.		Montgomery, Ala.	July 1, 1870, to June 30, 1871.
Chamberlain, H. B.	2d Lt. 10th Inf.		Camp Douglas, Utah.	Dec. 19, 1870, to Feb. 1, 1871.
Chamberlin, L. A.	1st Lt. 1st Art.		San Antonio, Tex.	Jan. 13 to March 8, 1871.
Chance, Jesse C.	2d Lt. 13th Inf.		Fort McIntosh, Tex.	June 1 to June 30, 1871.
Chapin, E. S.	2d Lt. 4th Art.		Fort Wadsworth, New York Harbor.	Sept. —, 1870, to June 30, 1871.
Chase, Constantine	1st Lt. 3d Art.		Fort Fred Steele, Wyo.	Aug. 21 to Sept. 19, 1870, and Feb. 13 to June 30, 1871.
Chickering, John W.	1st Lt. 6th Cav.	Captain	Charleston, W. Va.	Oct. 14 to Oct. 31, 1870.
Clague, John J.	2d Lt. 12th Inf.		Key West, Fla.	May 21 to June 30, 1871.
Clapp, William H.	1st Lt. 16th Inf.		Carlisle Barracks, Pa.	Dec. 31, 1870, to Jan. 31, 1871.
Clark, E. R.	2d Lt. 10th Inf.		Fort Yuma, Cal.	Feb. 1 to June 30, 1871.
Clark, Sidney E.	2d Lt. 2d Inf.	Captain	Corinth, Miss.	July 1 to Aug. 31, 1870.
Clifford, J. C.	2d Lt. Ord.		Austin, Tex.	July 1 to Aug. 7, 1870, and Feb. 4 to June 30, 1871.
Collins, James	1st Lt. 3d Cav.		Mt. Vernon Arsenal, Ala.	Nov. 17 to Dec. 16, 1870.
Conrad, C. H.	1st Lt. 15th Inf.		Mobile, Ala.	May 12 to June 30, 1871.
Cory, William C.	1st Lt. U. S. A.		Benicia Arsenal, Cal.	June 3 to June 30, 1871.
Cotton, G. P.	2d Lt. 1st Art.		Camp McDermitt, Nev.	May 20 to June 30, 1871.
Craig, Robert.	1st Lt. 4th Art.		Fort Stanton, N. Mex.	July 1, 1870, to Jan. 31, 1871.
Craig, Samuel.	1st Lt. 8th Inf.		Galveston, Tex.	July 1 to Dec. 31, 1870.
Craigie, D. J.	1st Lt. 12th Inf.	Captain	Fort Wadsworth, New York Harbor.	July 1 to Sept. 1, 1870.
Cranston, Arthur	2d Lt. 4th Art.		Fort Foote, Md.	July 1, 1870, to Jan. 17, 1871.
Cranston, James R.	2d Lt. 10th Inf.		Brunswick, Ga.	July 1 to Oct. 31, 1870.
Crawford, M. jr.	2d Lt. 2d Art.		Yuma Depot, Ariz.	July, 1870, to June 30, 1871.
Craycroft, Wm. T.	2d Lt. 7th Cav.		Raleigh, N. C.	Oct. 24, 1870, to May 31, 1871.
Crowell, Wm. H. H.	1st Lt. 6th Inf.		Brazos Santiago, Tex.	Jan. 7 to June 30, 1871.
Curry, James	2d Lt. 5th Art.		Fort Kenay, Alaska.	July 1 to Aug. 31, 1870.
Cusick, C. C.	2d Lt. 2d Inf.		Bagdad, Ky.	May 6 to June 30, 1871.
Custer, Thomas W.	1st Lt. 7th Cav.	Lt. Col.	Newport Barracks, Ky.	Dec. 10, 1870, to Jan. 24, 1871.
			Fort Monroe, Va.	Jan. 6 to May 31, 1871.
			Lower Brulé Agency, Dak.	Sept. 28, 1870, to June 30, 1871.
			Camp on Solomon River, Kans.	Oct. 13 to Oct. 18, 1870.
			Darlington, S. C.	June 10 to June 30, 1871.
Davis, C. E. L. B.	1st Lt. Eng'rs		Willett's Point, N. Y. H.	May 1 to June 30, 1871.
Davis, J. M. K.	2d Lt. 1st Art.		Fort Wood, N. Y. H.	Sept. 30, 1870, to Jan. 1, 1871.
Davis, F. L.	1st Lt. 22d Inf.		Fort Randall, Dak.	July 1 to Dec. 4, 1870.
DeLany, C. M.	2d Lt. 15th Inf.		Fort Sumner, N. Mex.	July 1 to 31, 1870.
DeLany, H.	2d Lt. 9th Inf.		Camp Kurgles, Neb.	June 10 to June 30, 1871.
Dempsey, C. A.	1st Lt. 2d Inf.		Patons, Ala.	Oct. 17 to Nov. 1, 1870.
			Entaw, Ala.	Nov. 12 to Nov. 22, 1870.
			Chattanooga, Tenn.	Dec. 30, 1870, to June 30, 1871.
DeRussy, R. E.	1st Lt. 2d Art.		Point San José, Cal.	July 1, 1870, to Oct. 31, 1870.
			Camp Tulare, Cal.	June 1 to 30, 1871.
Deshler, George W.	2d Lt. 1st Art.		Fort Ontario, N. Y.	Aug. 31, 1870, to June 30, 1871.
Dinwiddie, Wm. A.	2d Lt. 2d Cav.		Camp Douglas, Utah.	May 31 to June 30, 1871.
Dodge, H. C.	1st Lt. 2d Art.	Captain	Fort Stevens, Oreg.	Mar. 31 to May 8, 1871.
Donovan, Ed.	1st Lt. 24th Inf.		Fort McKavett, Tex.	Nov. 30 to Dec. —, 1870.
Dove, Wm. E.	1st Lt. 12th Inf.		C'p Independence, Cal.	July 1, 1870, to June 30, 1871.
Drew, George A.	1st Lt. 3d Cav.		Camp Bowie, Ariz.	Mar. 31 to June 30, 1871.
Drum, John.	1st Lt. 16th Inf.		Taylor Bar'ks, Louis-ville, Ky.	July 1, 1870, to Feb. 1, 1871.
Dudley, E. S.	2d Lt. 2d Art.		Cape Disappointment, W. T.	Oct. 15, 1870, to June 31, 1871.
Duff, George	2d Lt. 1st Inf.	1st Lieut.	Fort Grant, Mich.	Sept. 1, 1870, to June 30, 1871.
Durham, Cass.	1st Lt. 18th Inf.		Barnett Station, Ga.	July 1, 1870, to Feb. —, 1871.
Eakin, C. P.	1st Lt. 1st Art.	Major.	Fort Wood, N. Y. H.	Jan. 1, to June 30, 1871.
Eastman, James E.	1st Lt. 2d Art.		Alcatraz Island, Cal.	July 1, 1870, to June 30, 1871.
Ebstein, F. H. E.	2d Lt. 21st Inf.		Camp Date Creek, Ariz.	July 1, 1870, to June 30, 1871.
Eckles, John W.	1st Lt. 15th Inf.	Major.	Fort Bayard, N. Mex.	July 1 to 31, 1870.
			Fort Craig, N. Mex.	Oct. 1, 1870, to April 30, 1871.
Edgerly, W. S.	2d Lt. 7th Cav.		White Rock Creek, Ka.	Oct. 7 to 31, 1870.
Edgerton, E. C.	2d Lt. 5th Cav.		Mount Vernon, Ky.	Mar. 25 to June 10, 1871.
			Sidney, Neb.	Nov. 19, 1870, to June 17, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Name.	Lineal rank and regiment.	Brevet rank.	• Stations.	Time during year on duty as A. A. Q. M.
Edie, John R.	Captain Ord.	Major	Washi'n Arsenal, D. C.	May 4 to June 30, 1871.
Egbert, A. R.	2d Lt. 2d Inf.		Tallahassee, Fla.	Dec. 1, 1870, to June 30, 1871.
Elderkin, W. A.	Capt. C. S., U. S. A.	Major	Denver, Col.	Oct. 24, 1870, to June 30, 1871.
Ellsworth, E. D.	Capt. O. S. K.		Champlain Arsenal, Vt.	July 1, 1870, to April 30, 1871.
Esbridge, R. I.	1st Lt. R. Q. M. 23d Inf.	Captain.	Fort Dalles, Oreg.	Aug. 8 to Nov. 30, 1870.
Evans, George W.	1st Lt. 21st Inf.	Captain.	Fort Vancouver, W. T.	Jan. 3 to June 30, 1871.
Everett, William	2d Lt. 4th Art.		Wilmington Depot, Cal.	July 1, 1870, to Feb. 1, 1871.
Ewing, E. S.	1st Lt. 16th Inf.	Major	Drum Barracks, Cal.	Feb. 1 to June 30, 1871.
Ezekiel, D. I.	1st Lt. 14th Inf.	Captain.	Fort Washington, Md.	July 1, 1870, to June 30, 1871.
Febet, E. G.	Capt. 8th Cav.		Humboldt, Tex.	Feb. 10 to June 30, 1871.
Febet, E. O.	2d Lt. 2d Art.		Elizabethtown, Ky.	Mar. 29 to June 30, 1871.
Feno, D. G.	2d Lt. 17th Inf.		Fort Seldon, N. Mex.	July 1 to Nov. 15, 1870.
Fitch, Julian R.	1st Lt. 15th Inf.		Camp McDermitt, Nev.	Oct. 6, 1870, to April 30, 1871.
Flagler, D. W.	Captain Ord.	Lt. Col.	Grand River Ag'y, Dak.	July 1, 1870, to April 17, 1871.
Fletcher, Joshua S., jr.	Capt. 16th Inf.	Lt. Col.	Fort Cummings, N. M.	Nov. 30, 1870, to May 9, 1871.
Foote, George F.	1st Lt. R. Q. M. 8th Cav.	Captain.	Augusta Arsenal, Ga.	July 1, 1870, to May 12, 1871.
Forbush, William C.	1st Lt. 5th Cav.		Tuskegee, Ala.	Oct. — to 17, 1870.
Finger, Fred.	2d Lt. 4th Art.	Captain.	Fort Union, N. Mex.	Aug. 1, 1870, to June 30, 1871.
Gallagher, M. F.	2d Lt. R. Q. M. 2d Inf.	Captain.	Fort McPherson, Neb.	May 23 to 27, 1871.
Gardner, William F.	2d Lt. 24th Inf.		Fort Foote, Md.	Jan. 17 to June 30, 1871.
Garvey, Thomas	2d Lt. 1st Cav.		Huntsville, Ala.	July 1, 1870, to Feb. 15, 1871.
Gibbs, R. R.	1st Lt. 6th Inf.		Fort Bliss, Tex.	July 1, 1870, to April 30, 1871.
Gibson, F. M.	2d Lt. 7th Cav.		Camp Bidwell, Cal.	July 1, 1870, to May 27, 1871, and en route to Benicia to June 12, 1871.
Gibson, T. W.	1st Lt. 8th Cav.		Headquarters Department of the South, Atlanta, (Ga., and Louisville, Ky.	July 1, 1870, to June 30, 1871.
Gilbreath, E. C.	1st Lt. 11th Inf.		Fort Scott, Kans.	Dec. 1, 1870, to Mar. 7, 1871.
Goodale, G. A.	1st Lt. 23d Inf.	Captain.	Fort Sumner, N. Mex.	July 31 to Nov. —, 1870.
Goodloe, A. H.	1st Lt. R. Q. M. 22d Inf.		Fort Griffin, Tex.	July 1 to Aug. 20, 1870.
Gordon, Charles G.	1st Lt. 6th Cav.		Fort Klamath, Oreg.	April 27 to May 31, 1871.
Gould, William P.	Maj., Pm. U. S. A.		Fort Sully, Dak.	July 1, 1870, to June 30, 1871.
Grant, Alexander	1st Lt. 1st Cav.		Camp near Fort Hays, Kans.	May 7 to June 30, 1871.
Graves, William P.	1st Lt. 2d Art.	Major	Galveston, Tex.	April 19 to May 13, 1871.
Grashin, M. J.	Capt. O. S. K.		Camp Winfield Scott, Nev.	Aug. 1, 1870, to Sept. 30, 1870.
Greely, A. W.	2d Lt. 5th Cav.		Camp McDermitt, Nev.	April 20 to May 20, 1871.
Gregg, Thomas I.	1st Lt. 2d Cav.	Major	Camp Stevens, Oreg.	July 1, 1870, to Mar. 31, 1871.
Gregory, James F.	1st Lt. Engin'rs		Pikesville Arsenal, Md.	July 1, 1870, to June 30, 1871.
Grimes, George S.	1st Lt. 2d Inf.		Fort Laramie, Wyo.	March 16 to 26, 1871.
Griesbeck, S. W.	2d Lt. 6th Inf.		Camp Stambaugh, Wyo.	July 1, 1870, to Feb. 13, 1871.
Guthrie, John B., jr.	2d Lt. 13th Inf.		Yerba Buena Island, Cal.	July 1, 1870, to Mar. 18, 1871.
Haines, Abner, jr.	2d Lt. 2d Inf.		Fort Whipple, Va.	July 1, 1870, to June 30, 1871.
Hall, R. M.	1st Lt. R. Q. M. 1st Art.	Colonel	Little Rock, Ark.	July 1, 1870, to June 30, 1871.
Hall, William P.	2d Lt. 5th Cav.		Fort Rawlins, Utah	Mar. 4 to June 8, 1871.
Halloran, James	2d Lt. 12th Inf.		Newman, Ga.	Dec. 1 to 31, 1870.
Hamilton, John	1st Lt. 1st Inf.		Fort Hamilton, New York Harbor.	July 1, 1870, to June 30, 1871.
Hanner, William H.	2d Lt. 20th Inf.		North Platte, Neb.	Sept. 17 to Nov. 9, 1870, and Jan. 31 to June 30, 1871.
Hardenbergh, J. R.	1st Lt. 9th Inf.		Camp Cady, Cal.	July 1 to Aug. 10, 1870, and Dec. 1, 1870, to Mar. 31, 1871.
Harold, John	1st Lt. 19th Inf.		Fort Gratiot, Mich.	July 1 to Aug. 31, 1870.
Harris, Moses.	1st Lt. 1st Cav.	Captain.	Fort Ripley, Minn.	Nov. 16, 1870, to June 30, 1871.
Harrold, C. W.	1st Lt. 3d Art.		Sidney, Neb.	July 1 to Aug. 9, 1870.
Hart, Daniel	1st Lt. 25th Inf.	Major	Fort Pike, La.	July 1, 1870, to May 23, 1871.
Hartz, W. T.	1st Lt. 15th Inf.	Major	Camp Mogollon, Ariz., changed to—	July 1 to Aug. 31, 1870.
Harwood, Paul.	1st Lt. 20th Inf.		Camp Thomas, Ariz.	Sept. 1, 1870, to Jan. 21, 1871.
Hasson, Patrick.	2d Lt. 14th Inf.		Fort Pulaski, Ga.	Aug. 21, 1870, to June 30, 1871.
Hathaway, F. H.	2d Lt. R. Q. M. 5th Inf.	Captain.	Fort Bliss, Tex.	April 30 to June 30, 1871.
			Fort Bascom, N. Mex.	July 1, 1870, to Jan. 21, 1871, and June 13 to 30, 1871.
			Ft. G. H. Thomas, Dak., changed to—	July 1 to Sept. 6, 1870.
			Fort Pembina, Dak.	Sept. 6, 1870, to June 30, 1871.
			Whetstone Agency, Dak.	July 1 to Aug. 22, 1870.
			Fort Harker, Kans.	Aug. 10, 1870, to May 1, 1871.
			Ft. Leavenworth, Kans.	June 13 to 30, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Name.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Haughey, James A.	1st Lt. U. S. A.		Fort Fred Steele	July 1 to 14, 1870.
Hawley, William	1st Lt. 20th Inf.		Fort Wadsworth, Dak.	Oct. 1, 1870, to June 30, 1871.
Hayes, E. M.	1st Lt. R. Q. M. 5th Cav.		Fort McPherson, Neb.	July 1, 1870, to Feb. 12, 1871, and Feb. 19 to May 23, and May 27 to June 30, 1871.
Hazelton, James B.	1st Lt. 4th Art.	Captain	Charleston, W. Va.	July 1 to Oct. 14, 1870.
Head, George E.	Capt. U. S. A.	Major.	David's Island, New York Harbor.	— to Oct. 5, 1870.
Heath, Frank	2d Lt. 3d Art.		Fort Pulaski, Ga.	July 1 to Aug. 21, 1870.
Hein, Otto L.	2d Lt. 1st Cav.		Camp Winfield Scott, Nev.	Sept. 30, 1870, to Mar. 31, 1871.
Hennisee, A. G.	1st Lt. 8th Cav.		Fort Bascom, N. Mex.	April 1 to June 13, 1871.
Hentig, E. C.	1st Lt. 6th Cav.		Camp Wichita, Tex.	Oct. 1 to 31, 1870.
Hess, F. W.	1st Lt. 11th Inf.		Jefferson, Tex.	July 31 to Dec. 31, 1870.
Hill, R. M.	Capt. Ord'n'ce	Major.	Indianapolis Arsenal, Ind.	July 1, 1870, to June 30, 1871.
Hodgson, B. H.	2d Lt. 7th Cav.		Unionville, S. C.	April 5 to June 30, 1871.
Hoffman, A. W.	1st Lt. 10th Inf.		Brazos Santiago, Tex.	July 1, 1870, to Jan. 7, 1871.
Hogan, M. E.	1st Lt. 23d Inf.		Lower Brulé Agency, Dak.	Aug. 20 to Sept. 28, 1870.
Holden, E. S.	2d Lt. 4th Inf.		Fort Johnson, N. C.	Oct. 1, 1870, to June 30, 1871.
Hoppy, Edward	2d Lt. 9th Inf.		Fort Kearney, Neb.	Oct. 21, 1870, to June 30, 1871.
Howard, C. O.	2d Lt. 2d Art.		Cape Disappointment, Wash.	July 1 to Oct. 15, 1870.
Howard, O. H.	2d Lt. 5th Art.	Major	Point San José, Cal.	Nov. 1, 1870, to June 30, 1871.
Howe, Albion	1st Lt. 4th Art.	Captain	Fort Trumbull, Conn.	Oct. 7, 1870, to June 30, 1871.
			Fort Monroe, Va.	Dec. 23, 1870, to Jan. 6, 1871.
			Lumberton, N. C.	Jan. 31 to April 30, 1871.
			Shelby, N. C.	May 1 to May 31, 1871.
			Rutherford, N. C.	June 1 to June 30, 1871.
Howe, Henry S.	1st Lt. 17th Inf.		Cheyenne Agency, Dak.	Nov. 1, 1870, to Feb. 7, 1871.
Howe, Walter	2d Lt. 4th Art.		Fort Macon, N. C.	July 1, 1870, to June 30, 1871.
Hoyt, George S.	2d Lt. 18th Inf.		Warrenton, Ga.	Oct. 24, 1870, to Dec. 24, 1870.
Hubbard, E. B.	1st Lt. U. S. A.		Camp Toll Gate, Ariz.	July 1 to 31, 1870.
			Camp Hualpai, Ariz.	Aug. 1 to 15, 1870.
Hudson, Charles L.	1st Lt. 4th Cav.	Captain.	Austin, Texas.	Sept. 21, 1870, to Feb. 4, 1871.
			Fort Concho, Texas.	March 17 to June 30, 1871.
Huggins, Eli L.	1st Lt. 2d Art.		St. Paul's Isl'd, Alaska.	July 1 to 31, 1870.
Humfreville, J. L.	Capt. 9th Cav.		Fort Davis, Texas.	July 1 to Dec. 27, 1870.
Humphreys, B. S.	1st Lt. 1st Art.	Captain	Madison Barracks, N. Y.	July 1 to Sept. 17, 1870.
Humphreys, H. H.	1st Lt. 15th Inf.	Lt. Col.	Fort Bayard, N. M.	July 31, 1870, to Jan. 31, 1871.
Hunter, Ed.	1st Lt. R. Q. M. 1st Cav.		Benicia Barracks, Cal.	Oct. 8, 1870, to June 30, 1871.
Hurst, J. H.	2d Lt. 12th Inf.	Captain.	Camp Wright, Cal.	Sept. 30, 1870, to June 30, 1871.
Hyer, J. K.	1st Lt. 18th Inf.		Charleston, S. C.	Oct. 21, 1870, to April 4, 1871.
Ingalls, James M.	1st Lt. 2d Inf.		Chattanooga, Tenn.	July 1 to Dec. 30, 1870.
Ingersoll, Ed.	Capt. U. S. K.		National Armory, Springfield, Mass.	July 1, 1870, to June 30, 1871.
Igens, H. A.	2d Lt. 7th Inf.		Camp Baker, Montana.	April 18 to May 30, 1871.
Irwin, D. A.	1st Lt. 4th Cav.		Indianola, Texas.	July 1 to Sept. 15, 1870.
Ives, R. A.	2d Lt. 5th Art.		Fort Prible, Mo.	Jan. 20 to June 30, 1871.
Jackson, James	Capt. 1st Cav.	Major.	Fort Fred Steele, Wyo.	July 1 to Aug. 31, 1870, and Sept. 19, 1870, to Feb. 13, 1871.
Jennings, G. D.	2d Lt. 3d Art.		New San Diego, Cal.	Feb. 22 to April 19, 1871.
Johnson, John B.	1st Lt. 3d Cav.		Camp Hualpai, Ariz.	May 17 to June 30, 1871.
Johnston, John L.	1st Lt. R. Q. M. 21st Inf.	Captain.	Camp McDowell, Ariz.	July 1 to Aug. 31, 1870.
			New San Diego, Cal.	Feb. 2 to 22, 1871.
			Tucson Depot, Ariz.	June 21 to 30, 1871.
Jones, E. P.	Capt. O. S. K.		Columbus Arsenal, O.	July 1 to 20, 1870, and Aug. 18, 1870, to June 30, 1871.
Jones, F. B.	1st Lt. R. Q. M. 3d Inf.		Fort Marcy, N. Mex.	July 1 to Aug. 1, 1870, and Oct. 1, 1870, to Jan. 31, 1871.
Jordan, Charles	2d Lt. 16th Inf.		Fort Dodge, Kans.	March 12 to June 30, 1871.
			Carrollton, Ala.	Oct. 18 to Nov. 30, 1870.
			Eatonton, Ga.	Dec. 1 to 31, 1870.
Keeffe, Joseph	1st Lt. 5th Art.	Captain.	Jackson, Miss.	March 13 to June 30, 1871.
			Plattsburgh Barracks, N. Y.	July 1, 1870, to June 30, 1871.
Keller, Charles	1st Lt. 2d Inf.		Summerville, Ga.	July 1 to Aug. 31, 1870.
Keogh, Myles W.	Capt. 7th Cav.	Lt. Col.	Camp on Saline River, Kans.	Sept. 9 to Oct. —, 1870.
Kilbourne, C. E.	1st Lt. 2d Art.		Fort Stevens, Oreg.	May 8 to June 30, 1871.
King, James S.	2d Lt. 12th Inf.		Fort Whipple, Ariz.	Feb. 18 to —, 1871.
Kingsbury, Geo. W.	2d Lt. 12th Inf.	1st Lt.	Camp Gaston, Cal.	July 31, 1870, to June 30, 1871.
Kistler, A. C.	Capt. 23d Inf.		Camp Warner, Oreg.	July 1 to Dec. 1, 1870.
Kobbe, William A.	1st Lt. 3d Inf.	Major.	Fort Marcy, N. Mex.	Aug. 1 to Oct. 1, 1870.
Krause, William	1st Lt. 3d Inf.		Fort Dodge, Kans.	Jan. 21 to Mar. 12, 1871.
Kress, John A.	1st Lt. Ord.	Major.	Alleghany Arsenal, Pa.	July 1, 1870, to Mar. 1, 1871.
			Vancouver Arsenal, W. T.	May 1 to June 30, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Name.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Lafferty, John	1st Lt. 8th Cav.		Fort Union, N. Mex.	Oct. — to Nov. 11, 1870.
Lambert, John J.	2d Lt. 5th Inf.		Fort Reynolds, Colo.	July 1, 1870, to June 30, 1871.
Latchford, Thomas	1st Lt. R. Q. M.		Fort Snelling, Minn.	July 1 to Dec. 13, 1870.
Lawson, Joseph	1st Lt. 3d Cav.		Camp Colorado, Ariz.	Jan. 30 to April 30, 1871.
Lawton, Henry W.	1st Lt. 4th Cav.		Fort McKavett, Texas.	July 1 to Nov. 30, and Dec. — 1870, to Jan. 23, 1871.
Layton, C. R.	Capt. 16th Inf.	Major	Macon, Ga.	Dec. — to Dec. 31, 1870.
Leefe, John G.	1st Lt. R. Q. M.	Captain	Jackson Barracks, New Orleans, La.	July 1, 1870, to June 30, 1871.
Leonard, John	1st Lt. 1st Inf.	Major	Fort Mackinac, Mich.	July 1 to Nov. 11, 1870.
Lewia, John F.	1st Lt. 21st Inf.		Camp Crittenden, Ariz.	July 1 to Aug. 31, 1870.
Lewia, John W.	1st Lt. 23d Inf.		Camp Harney, Oreg.	July 1 to Nov. 25, 1870.
Lord, James H.	1st Lt. R. Q. M.	Major	Presidio, San Francisco, Cal.	July 1, 1870, to June 30, 1871.
Lord, Thomas W.	2d Lt. 20th Inf.	1st Lt.	Fort Ransom, Dak.	Nov. 24, 1870, to June 30, 1871.
Love, George M.	2d Lt. 16th Inf.	Lt. Col.	Taylor Barracks, Louisville, Ky.	Feb. 1 to June 30, 1871.
Lyle, D. A.	2d Lt. 2d Art.		Fort Wrangell, Alaska	July 1 to Sept. 30, 1870.
MacGowan, A. B.	1st Lt. 12th Inf.		Camp Wright, Cal.	July 1 to Sept. 30, 1870.
Madden, Frank	2d Lt. U. S. A.		Carlisle Barracks, Pa.	July 1 to Dec. 31, 1870.
Mahken, John H.	1st Lt. 8th Cav.	Major	Carlisle Barracks, Pa.	March 31 to June 30, 1871.
Maize, William R.	1st Lt. 20th Inf.	Captain	Fort Abercrombie, Dak.	Feb. 9 to March 3, 1871.
Markland, M.	2d Lt. 1st Inf.		Fort Mackinac, Mich.	Nov. 11, 1870, to May 18, 1871.
May, James H.	1st Lt. 12th Inf.	Captain	Fort Hall, Idaho	July 1 to Oct. 20, 1870.
McAllister, J.	Adj. Ordnance.	Colonel	Benicia Arsenal, Cal.	May 15 to June 3, 1871.
McCaskey, Wm. S.	1st Lt. R. Q. M.		Fort Wadsworth, Dak.	July 1 to Aug. 15, 1870.
	20th Inf.		Fort Totten, Dak.	Aug. —, 1870, to Mar. 31, 1871.
McCanley, C. A. H.	2 Lt. 3d Art.		Fort Snelling, Minn.	May 1 to June 30, 1871.
McCoy, John	1st Lt. 16th Inf.	Major	Savannah, Ga.	May 31 to June 30, 1871.
McCrea, Tulley	Capt. 1st Art.	Major	Aberdeen, Miss.	March 30 to June 30, 1871.
McDermott, Geo.	1st Lt. 5th Inf.		West Point, N. Y.	July 1, 1870, to June 30, 1871.
			Kit Carson, Colo.	July 1 to Dec. —, 1870.
McDermott, G. B.	2d Lt. 23d Inf.		Newport Barracks, Ky.	Jan. 24 to June 30, 1871.
			Camp on Three Forks Owyhee, Idaho	July 1, 1870, to June 30, 1871.
McDougall, George P.	2d Lt. 6th Inf.		Fort Gibson, L. T.	July 1 to Sept. 24, 1870.
McDougall, Thos. M.	1st Lt. 7th Cav.	Captain	Spartanburgh, S. C.	May 5 to June 30, 1871.
McIntosh, Donald	1st Lt. 7th Cav.		Camp on Solomon River, Kans.	Sept. 17 to Oct. 13, 1870.
McIntyre, A.	2d Lt. 2d Inf.		Patona, Ala.	Nov. 17, 1870, to June 30, 1871.
McKee, George W.	1st Lt. Ord.	Major	Benicia Arsenal, Cal.	July 1, 1870, to May 15, 1871.
McKeever, Samuel	2d Lt. 2d Inf.	Captain	Mobile, Ala.	July 1, 1870, to May 12, 1871.
McLaughlin, W. H.	Capt. U. S. A.		Fort McIntosh, Texas	July 1 to 4, 1870.
McNitt, Ira	2d Lt. 3d Art.		Barrancas, Fla.	Jan. 16 to June 30, 1871.
Merritt, Thomas E.	1st Lt. 24th Inf.		Fort Duncan, Texas	April 30 to June 30, 1871.
Michaclia, O. E.	1st Lt. Ord.	Captain	Watertown Arsenal, Mass.	Jan. 16 to June 30, 1871.
Miller, C. P.	1st Lt. 4th Art.		Camp on Solomon River, Kans.	July 1 to Sept. 17, 1870.
Miller, James	1st Lt. R. Q.		Greenborough, Ga.	Dec. — to Dec. —, 1870.
	M. 2d Inf.		Huntsville, Ala.	Feb. 15 to June 30, 1871.
Miller, W. A.	1st Lt. 18th Inf.		Newberry, S. C.	June 10 to June 30, 1871.
Milimore, A. E.	1st Lt. 1st Art.		Madison Barracks, N. Y.	Sept. 17, 1870, to June 30, 1871.
Mitchel, O. M.	1st Lt. 4th Art.		Fort Johnson, N. C.	July 1, to Oct. 1, 1870.
Mitchell, George	1st Lt. 2d Art.		Fort Abercrombie, Da.	Nov. 10, 1870, to Feb. 8, 1871.
Mitchell, William	1st Lt. 3d Inf.	Captain	Fort Larned, Kans.	July 1 to Oct. 1, 1870.
Moore, Francis	1st Lt. R. Q.		Fort Stockton, Texas	July 1 to Dec. 31, 1870, and Jan. 31 to June 30, 1871.
	M. 9th Cav.		do	Dec. 31, 1870, to Jan. 31, 1871.
Morgan, James N.	1st Lt. 24th Inf.	Major	Fort Snelling, Minn.	Jan. 1 to May 1, 1871.
Morris, L. M.	1st Lt. 20th Inf.	Captain	Vicksburg, Miss.	July 1, 1870, to March 4, 1871.
Morrison, T. W.	2d Lt. 16th Inf.		Meridian, Miss.	May 3 to June 30, 1871.
Morton, Alfred	1st Lt. R. Q.		Fort D. A. Russell, W. Y.	July 21, 1870, to June 30, 1871.
	M. 9th Inf.			
Morton, A. L.	2d Lt. 5th Art.		Ft Independence, Mass.	July 1 to Nov. 1, 1870.
Morton, Charles	2d Lt. 3d Cav.		Camp Rawlins, Ariz.	July 1 to Aug. 1, 1870.
			Camp Verde, Ariz.	Aug. 18, 1870, to Jan. 30, 1871.
Moss, Henry N.	1st Lt. R. Q.		Fort Vancouver, W. T.	July 1 to Aug. 8, 1870.
	M. 1st Cav.			
Mulford, L. L.	1st Lt. 3d Cav.		Camp Rawlins, Ariz.	Aug. 1 to Aug. 15, 1870.
			Camp Verde, Ariz.	Aug. 15, 1870, to Feb. 28, 1871.
Murlock, D. H.	1st Lt. 6th Inf.		Fort Scott, Kans.	March 7 to June 30, 1871.
Murphy, E. P.	2d Lt. 2d Art.		Fort Riley, Kans.	March 14 to May 10, 1871.
Newly, Robert	1st Lt. 24th Inf.		Fort Quitman, Texas	July 1 to Dec. 31, 1870.
Nichols, F. C.	1st Lt. 1st Art.		Humboldt, Tenn.	July 1, 1870, to Feb. 10, 1871.
Nixon, John B.	1st Lt. 24th Inf.		Fort Concho, Texas	July 1 to 12, 1870.
			Fort McKavett, Texas	Jan. 23 to June 30, 1871.
Nolen, Lewis	1st Lt. 12th Inf.		Camp Colorado, Ariz.	July 1, 1870, to Jan. 31, 1871.
Nordstrom, C. E.	1st Lt. 10th Cav.		Fort Arbuckle, Ind. T.	July 1, 1870, to May —, 1871.
Norton, L. B.	1st Lt. 1st Art.	Major	Fort Whipple, Va.	— to May 1, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Name.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Norvell, S. T.	Capt. 10th Cav.		St. Paul, Minn.	Sept. 27, 1870, to Jan. 31, 1871.
Nowlan, H. J.	1st Lt. 7th Cav.		Ft. Leavenworth, Kans.	Sept. 2 to Nov. 5, 1870.
O'Brien, John J.	2d Lt. 4th Inf.		Fort Fetterman, Wyo.	July 1, 1870, to Mar. 30, 1871.
O'Brien, M.	1st Lt. 1st Art.		Mount Sterling, Ky.	April 1 to June 30, 1871.
O'Connor, L. L.	1st Lt. 3d Cav.		Fort Riley, Kans.	July 1 to Aug. 31, 1870.
O'Reilly, Thomas P.	2d Lt. 22d Inf.		Camp Bowie, Ariz.	Oct. 20 to Nov. 27, 1870.
Osgood, H. B.	2d Lt. 3d Art.		Whetstone Ag'y, Dak.	Aug. 22 to Dec. 4, 1870, and March — to April 24, 1871.
Owen, William McK.	1st Lt. 21st Inf.		Barrancas, Fla.	July 1, 1870, to Jan. 16, 1871.
Parker, F. H.	Capt. Ord.	Major.	Camp Verde, Ariz.	July 1 to Aug. 18, 1870.
Parsons, F. E.	1st Lt. 22d Inf.		Detroit Arsenal, Mich.	July 1, 1870, to June 30, 1871.
Paul, Charles R.	1st Lt. 10th Inf.		Fort Stephenson, Dak.	July 1 to Aug. 13, 1870.
Payne, John A.	2d Lt. 19th Inf.		Warrenton, Ga.	July 1 to Oct. 28, 1870, and Jan. 1 to Feb. 28, 1871.
Phipps, Frank H.	1st Lt. Ord.	Captain	Shreveport, La.	Nov. 1, 1870, to June 7, 1871.
Pickett, George B.	2d Lt. 16th Inf.		Washington Ars'l, D. C.	July 1, 1870, to May 4, 1871.
Poland, M. L.	1st Lt. Ord.	Captain	Augusta Arsenal, Ga.	May 12 to June 30, 1871.
Pollock, Robert.	1st Lt. 21st Inf.		Lebanon, Ky.	July 1, 1870, to March 28, 1871.
Pond, Richard H.	Cap. 12th Inf.	Major.	Rock Island Ars'l, Ill.	July 1, 1870, to June 30, 1871.
Porter, James E.	2d Lt. 7th Cav.		Camp Goodwin, Ariz.	July 1, 1870, to Mar. 16, 1871.
Powell, C. F.	2d Lt. Engs.		Camp Mojave, Ariz.	Jan. 24 to June 30, 1871.
Pratt, H. C.	1st Lt. 13th Inf.		Chester, S. C.	March 29 to April 12, 1871.
Pratt, James, jr.	1st Lt. U. S. A.		Willett's Point, N. Y. Harbor.	July 1, 1870, to May 1, 1871.
Prince, William.	1st Lt. Ord.	Captain	Camp Brown, Wyo.	May 26 to June 30, 1871.
Putnam, Hy. R.	Capt. 21st Inf.		Fort Duncan, Texas.	July 1 to 31, 1870.
Quentin, J. E.	1st Lt. 14th Inf.		David's Island, N. Y. Harbor.	Oct. 5 to Nov. 5, 1870.
Quimby, H. B.	1st Lt. R. Q. M. 25th Inf.		Frankford Arsenal, Pa.	July 1, 1870, to June 30, 1871.
Quinby, Ira.	1st Lt. R. Q. M. 11th Inf.		Camp Cady, Cal.	Aug. 10 to Nov. 30, 1870.
Quinn, Thomas F.	1st Lt. 24th Inf.	Captain.	Old Ponca Agency, Dak.	July 1 to Aug. 22, 1870.
Ramsey, J. G.	Capt. 2d Art.		Fort Clark, Texas.	July 1, 1870, to June 30, 1871.
Randall, E. L.	1st Lt. 5th Inf.		Fort Concho, Texas.	July 12, 1870, to Jan. 31, 1871.
Rawolle, William C.	1st Lt. R. Q. M. 2d Cav.		Fort Laramie, Wyo.	Jan. 1 to March 16, 1871.
Ray, P. H.	2d Lt. 8th Inf.		Frankfort, Ky.	March 31 to June 30, 1871.
Reedy, William J.	1st Lt. 22d Inf.		Camp on Saline River, Kans.	July 1 to Sept. 9, 1870.
Reilly, James W.	1st Lt. Ord.	Captain.	Fort Harker, Kans.	May 1 to June 30, 1871.
Remak, S.	2d Lt. 5th Art.		Omaha Barracks, Neb.	Aug. 23, 1870, to June 30, 1871.
Rexford, William H.	Capt. O. S. K.		Raleigh, N. C.	July 1 to Oct. 31, 1870.
Rice, Frank R.	1st Lt. U. S. A.	Captain.	Fort Rice, Dak.	July 1 to Aug. 15, 1870.
Rice, William F.	1st Lt. 23d Inf.		Watervleit Arsenal, Troy, N. Y.	July 1, 1870, to June 30, 1871.
Richards, William V.	1st Lt. R. Q. M. 16th Inf.	Captain.	Fort Sullivan, Me.	July 1, 1870, to Mar. 31, 1871.
Ring, F. M.	1st Lt. 2d Art.		Mount Vernon Arsenal, Ala.	July 1 to Nov. 17, 1870, and Dec. —, 1870, to June 30, 1871.
Roberts, R. K.	1st Lt. 5th Inf.		Newport Barracks, Ky.	July 1 to Dec. 10, 1870.
Roberts, C. S.	1st Lt. 17th Inf.	Captain.	Fort Colville, Wash.	Jan. 1 to June 30, 1871.
Robinett, Charles.	1st Lt. 20th Inf.		Grenada, Miss.	July 1 to Nov. 30, 1870.
Robinson, Frederick.	1st Lt. 5th Art.	Captain.	Nashville, Tenn.	Dec. 1, 1870, to Jan. 30, 1871, and Mar. 1 to June 30, 1871.
Robinson, F. W.	2d Lt. 2d Cav.		Fort Tongass, Alaska.	July 1 to Oct. 7, 1870.
Robinson, Thomas B.	1st Lt. 19th Inf.		Fort Preble, Me.	July 1, 1870, to Jan. 31, 1871.
Rockefeller, C. M.	2d Lt. 9th Inf.		Fort Stevenson, Dak.	Aug. 13, 1870, to June 30, 1871.
Rockwell, C. H.	2d Lt. 5th Cav.		Fort Totten, Dak.	July 17 to Aug. —, 1870.
Rockwell, James, jr.	2d Lt. 1st Cav.		Fort Ransom, Dak.	Sept. 19 to Nov. 24, 1870.
Rodgers, C. P.	1st Lt. 5th Cav.		Ft. Independence, Mass.	Nov. 1, 1870, to June 30, 1871.
Rodman, John B.	2d Lt. 20th Inf.		Camp Stambaugh, Wyo.	April 5 to June 30, 1871.
Roe, Charles F.	1st Lt. U. S. A.		Forta Jackson and St. Philip, La.	May 25 to June 30, 1871.
Rogers, B. H.	1st Lt. 13th Inf.		Sidney Barracks, Neb.	Aug. 9 to Sept. 26, 1870.
Rogers, J. S.	2d Lt. 1st Inf.		Fort McPherson, Neb.	Feb. 12 to 19, and May 23 to 27, 1871.
Rogers, William P.	2d Lt. 17th Inf.		Fort Lapwai, I. T.	Jan. 1 to June 30, 1871.
Rogers, William W.	2d Lt. 14th Inf.		Carlisle Barracks, Pa.	Jan. 31 to Mar. 31, 1871.
Ropes, James M.	1st Lt. 8th Cav.		Fort Abercrombie, Dak.	July 1 to Aug. 31, 1870.
Rosecrantz, F.	2d Lt. 16th Inf.		Jefferson, Tex.	July 1 to 31, 1870.
Ross, John M.	2d Lt. 21st Inf.		Fort Bridger, Utah.	March 8 to June 30, 1871.
Ross, William J.	2d Lt. 21st Inf.		Fort Wayne, Mich.	April 19 to May 31, 1871.
Russell, E. K.	1st Lt. 1st Art.		Cheyenne Agency, Dak.	Feb. 7 to June 30, 1871.
Russell, Gerald.	Capt. 3d Cav.		Crow Creek Ag'y, Dak.	July 1 to Aug. 18, 1870.
			Fort Garland, Colo.	Jan. 1 to June 30, 1871.
			Tuskegee, Ala.	Oct. 17 to Nov. 13, 1870.
			Camp McDowell, Ariz.	Jan. 13 to Mar. 14, 1871.
			Camp Crittenden, Ariz.	Sept. 1, 1870, to June 30, 1871.
			Fort Delaware, Del.	July 1 to Oct. 18, 1870.
			Camp Bowie, Ariz.	Nov. 22, 1870, to Mar. 31, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Names.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Rutherford, R. G.	2d Lt. 12th Inf.	Captain.	Fort Columbus, N. Y. Harbor.	July 1, 1870, to June 30, 1871.
Ryan, E. T.	2d Lt. 15th Inf.		Ft. Cummings, N. Mex.	July 1 to Nov. 30, 1870, and May 9 to June 30, 1871.
Narson, H. B.	2d Lt. 2d Inf.		Entaw, Ala.	July 1 to Oct. 17, 1870.
Schindel, J. P.	Capt. 6th Inf.		Campat Cheyenne and Arapahoe Ag'y, L. T.	July 1 to 13, 1870, and Jan. 31 to April 1, 1871.
Schultz, Thilo	1st Lt. U. S. A.		Fort Valley, Ga.	July 1, to Aug. 31, 1870.
Scott, John	2d Lt. 4th Inf.		Camp Brown, Wyo.	July 1, 1870, to May 26, 1871.
Sellmer, Charles	2d Lt. 3d Art.	Captain.	Mount Vernon, Ky.	June 10 to 30, 1871.
Sharp, Thomas	1st Lt. 1st Inf.		Key West, Fla.	Mar. 12 to May 21, 1871.
Sheetz, J. A.	1st Lt. 4th Inf.	Major.	Fort Mackinac, Mich.	May 19 to June 30, 1871.
Shelby, Isaac O.	2d Lt. 16th Inf.		Lebanon, Ky.	Mar. 28 to June 30, 1871.
Shelton, E. H.	2d Lt. 1st Cav.		Jackson, Miss.	July 1, 1870, to Mar. 13, 1871.
Shepard, C. H.	1st Lt. 9th Inf.		Vicksburgh, Miss.	Mar. 4 to June 30, 1871.
Shepherd, John J.	1st Lt. 12th Inf.		Camp McDowell, Ariz.	Mar. 14 to May 22, 1871.
Sherman, James L.	1st Lt. 1st Art.		Fort Bridger, Utah.	July 1, 1870, to Mar. 8, 1871.
Silva, V. M. C.	1st Lt. 21st Inf.		Campon Loup Fk. Neb.	April 13 to June 9, 1871.
Simpson, James F.	2d Lt. 25th Inf.	Captain.	Camp Gaston, Cal.	July 1 to 31, 1870.
Simpson, John	2d Lt. 4th Art.		Fort Niagara, N. Y.	May 14 to June 30, 1871.
Smead, A. D. B.	2d Lt. 3d Cav.		Infantry Camp, Pinal Mountains, Ariz.	Nov. 28, 1870, to Feb. 18, 1871.
Smith, A. E.	1st Lt. 7th Cav.	Captain.	Fort Duncan, Tex.	July 31, 1870, to April 13, 1871.
Smith, H. M.	Capt. 21st Inf.		Lumberton, N. C.	Jan. 14 to 31, 1871.
Smith, H. W.	1st Lt. 7th Cav.		Camp Hualpai, Ariz.	Feb. 28 to May 17, 1871.
Smith, Lewis	1st Lt. R. Q. M.		Fort Scott, Kans.	Aug. 28 to Dec. 1, 1870.
Smith, O. M.	2d Lt. 22d Inf.		Camp Pinal, Ariz.	Feb. 18 to June 30, 1871.
Spencer, William V.	1st Lt. 13th Inf.		Camp Sturgis, Kans.	July 1 to Oct. 13, 1870.
Spurgin, W. F.	1st Lt. 21st Inf.	Major.	Key West, Fla.	July 1, 1870, to Mar. 12, 1871.
Stanhope, G. W.	Capt. 12th Inf.	Lt. Col.	Charleston, S. C.	April 4 to June 30, 1871.
Steele, George W.	1st Lt. R. Q. M.		Camp Crow Creek Agency, Dak.	Aug. 18, 1870, to May 5, 1871.
Steelhammer, Chas.	Capt. 15th Inf.		Fort Rawlins, Utah.	July 31 to August 11, 1870.
Stephenson, William	1st Lt. U. S. A.		New San Diego, Cal.	April 19 to June 30, 1871.
Stille, L. B.	1st Lt. 23d Inf.		Fort Yuma, Cal.	Dec., 1870, to Jan., 1871.
Stouch, G. W. H.	1st Lt. 3d Inf.		Fort Sedgwick, Col.	Sept. 14, 1870, to Mar. 15, 1871.
Stryer, Charles	A. Sur. U. S. A.		Fort Laramie, Wyo.	March 26 to June 30, 1871.
Summers, Richard	2d Lt. 9th Inf.		Fort Bayard, N. M.	January 30 to June 30, 1871.
Swift, Joseph G.	1st Lt. 5th Inf.		Fort Kearney, Neb.	July 1 to October 21, 1870.
Taylor, A. C.	1st Lt. 2d Art.		Sitka, Alaska	July 1, 1870, to May 15, 1871.
Taylor, D. M.	2d Lt. 1st Art.		Fort Dodge, Kansas	July 1, 1870, to Jan. 21, 1871.
Taylor, Frank	2d Lt. 14th Inf.		Fort Selden, N. M.	Nov. 15, 1870, to June 30, 1871.
Taylor, F. B.	2d Lt. 18th Inf.		Fort D. A. Russell, Wyo.	July 1 to 21, 1870.
Taylor, George McM	1st Lt. 23d Inf.		Fort Trumbull, Conn.	July 1 to October 7, 1870.
Thibaut, F. W.	1st Lt. 6th Inf.		Sitka, Alaska	May 15 to June 30, 1871.
Thoburn, S. B.	2d Lt. 23d Inf.		Fort Schuyler, N. Y. H'r	July 1 to September 30, 1871.
Thompson, E. F.	Capt. U. S. A.		Brule Agency, Dakota	July 1 to August 20, 1870.
Thompson, John C.	1st Lt. R. Q. M.		Fort Fetterman, Wyo.	March 30 to June 30, 1871.
Thorne, P. M.	3d Cav.		Edgefield, S. C.	Oct. 28 to Nov. 30, 1870.
Tisdall, William N.	1st Lt. 22d Inf.		Lexington, Ga.	December 15 to 31, 1870.
Trout, John F.	Capt. 1st Inf.		Fort Boise, Idaho	July 1, 1870, to June 30, 1871.
Tully, Redmond	1st Lt. 33d Inf.		Fort Smith, Ark.	July 1, 1870, to June 30, 1871.
Tyler, John	1st Lt. 12th Inf.	Captain.	Fort Klamath, Oregon	July 1, 1870, to April 27, 1871.
Ulio, James	1st Lt. R. Q. M.	Major.	Fort Sedgwick, Col.	July 1 to September 14, 1870.
Van Horne, Wm. M.	2d Lt. 2d Inf.		Camp Halleck, Nev.	July 1 to November 30, 1870.
Varney, A. L.	2d Lt. Ord.		Camp Verde, Arizona	April 10 to June 30, 1871.
Veil, Charles H.	1st Lt. 1st Cav.	Major.	Fort Totten, Dakota	July 1 to 17, 1870.
Viven, John L.	1st Lt. R. Q. M.	Captain.	Fort Wayne, Mich.	July 1, 1870, to Jan. 31, 1871.
Wager, Barnet	2d Lt. 2d Art.		Camp Warner, Oregon	April 30 to June 30, 1871.
Walker, Mark	1st Lt. 19th Inf.	Captain.	Camp Mojave, Arizona	July 1, 1870, to Jan. 24, 1871.
Walton, John W.	2d Lt. R. Q. M.		Fort Porter, Buffalo, New York.	July 1, 1870, to May 30, 1871.
Ward, F. K.	2d Lt. 1st Cav.		Fort Wayne, Mich.	May 31 to June 30, 1871.
Ward, G. S. L.	2d Lt. 22d Inf.		Ashville, Ala.	Sept. 13, 1870, to —
			Clinton, Ga.	Dec. — to 31, 1870.
			Monticello, Ga.	Dec. — to 31, 1870.
			Fort Rice, Dakota	Aug. 15, 1870, to June 30, 1871.
			Watertown Arsenal, Mass.	July 1 to Sept. 17, 1870.
			Camp McDowell, Ariz.	Sept. 1, 1870, to Jan. 13, 1871.
			Angel Island, Cal.	July 1, 1870, to April 14, 1871.
			Camp Tulare, Cal.	February to May 31, 1871.
			Baton Rouge, La.	May 13, to June 30, 1871.
			San Antonio, Texas	July 1, 1870, to Jan. 13, 1871.
			Fort Concho, Texas	Jan. 31 to March 17, 1871.
			Fort Richardson, Tex.	April 15 to June 30, 1871.
			Camp Harney, Oregon	Nov. 25, 1870, to June 30, 1871.
			Headq's Dep. Dakota, St. Paul, Minn.	February 1 to 7, 1871.

A.—Annual report of officers on duty as acting assistant quartermasters, &c.—Continued.

Names.	Lineal rank and regiment.	Brevet rank.	Stations.	Time during year on duty as A. A. Q. M.
Ward, H. C.	1st Lt. 16th Inf.	Captain.	Nashville, Tenn.	July 1 to Dec. 1, 1870, and Feb. 1 to 28, 1871.
Ward, Thomas	1st Lt. 1st Art.	Captain	Fort Ontario, N. Y.	July 1 to Aug. 31, 1870.
Waring, John K.	2d Lt. 2d Inf.		Tuscaloosa, Ala.	July 1 to Dec. 31, 1870.
Warner, Charles N.	1st Lt. 4th Art.		Lumberton, N. C.	Nov. 23, 1870, to Jan. 14, 1871.
Weaver, Stanton	1st Lt. 20th Inf.		Fort Ripley, Minn.	July 1 to Nov. 16, 1870.
Wenig, Thomas M.	2d Lt. 19th Inf.		Donaldsonville, La.	Nov. 29, 1870, to Feb. 28, 1871.
Wesendorff, Max	1st Lt. 1st Cav.		Bremond, Tex.	July 6, 1870, to Feb. 1, 1871.
Wessells, H. W., jr.	1st Lt. 3d Cav.		Camp McDowell, Ariz.	May 22 to June 30, 1871.
Weston, John F.	1st Lt. and R. Q. M. 7th Cav.		Camp Sturgis, Kans.	Oct. 13 to Nov. 30, 1870.
			Fort Leavenworth, Kans.	Dec. 30, 1870, to Mar. 17, 1871.
Wetmore, Oliver	1st Lt. 19th Inf.		Baton Rouge, La.	August 9 to Dec. 10, 1870.
Wheeler, M. M.	1st Lt. 8th Cav.		Fort Union, N. M.	July 1 to 31, 1870.
Whitehead, Fred. F.	1st Lt. 18th Inf.	Major.	Yorkville, S. C.	March — to June 30, 1871.
Whitman, R. E.	1st Lt. 3d Cav.		Camp Grant, Ariz.	Jan. 24 to April 30, 1871.
Whitney, John	1st Lt. 11th Inf.		Bremond, Tex.	Feb. 1 to June 30, 1871.
Whittemore, Jas. M.	Capt. Ord.	Major.	Kennebec Arsenal, Me.	July 1, 1870, to June 30, 1871.
Whitten, Jas. H.	2d Lt. 5th Inf.		Fort Wallace, Kans.	April 27 to June 30, 1871.
Wightman, L.	1st Lt. 8th Cav.		Camp McDermitt, Nev.	July 1 to Oct. 6, 1870.
Willard, J. H.	2d Lt. Engrs.		Jefferson Barracks, Mo.	July 1 to Dec. 3, 1870.
Willard, Wells	1st Lt. U. S. A.	Captain	Fort Union, N. M.	July 1 to Sept. 30, 1870.
Winters, William H.	1st Lt. 1st Cav.		Camp Bowie, Ariz.	July 1 to Oct. 20, 1870.
Wilson, Charles J.	Capt. U. S. A.	Major.	Fort Wood, N. Y. H.	July 1 to Sept. 30, 1870.
Wilson, George S.	2d Lt. 12th Inf.		Fort Hall, Idaho	Oct. 20, 1870, to June 30, 1871.
Witherill, Charles T.	1st Lt. 19th Inf.	Major.	Forta Jackson and St. Phillip, La.	July 1, 1870, to May 25, 1871.
Wolcott, C. C.	2d Lt. 3d Art.		Camp on Republican River, Kans.	July 1 to August 31, 1870.
Wood, Oliver E.	1st Lt. 5th Art.		Fort Sullivan, Me.	March 31 to June 30, 1871.
Wood, W. W.	2d Lt. 20th Inf.		Fort Totten, Dakota.	March 31 to June 30, 1871.
Yates, George W.	Capt. 7th Cav.		White Rock Creek, Kans.	Sept. 13 to Oct. 7, 1870.
Yeckley, J. A.	2d Lt. 20th Inf.		Fort Ransom, Dakota.	July 1 to Sept. 19, 1870.

Total number of officers, 433.

B.—Stations and duties of officers of the Quartermaster's Department, July 1, 1871.

I.

QUARTERMASTER GENERAL.

Meigs, Brevet Major General M. C., Washington, D. C.

COLONELS AND ASSISTANT QUARTERMASTERS GENERAL.

Allen, Brevet Major General Robert, Quartermaster General's office, Washington, D. C.
 Rucker, Brevet Major General D. H., chief quartermaster Military Division of the Missouri, Chicago, Illinois.

Ingalls, Brevet Major General Rufus, chief quartermaster Department of the East and in charge of depot, New York City.

LIEUTENANT COLONELS AND DEPUTY QUARTERMASTERS GENERAL.

Easton, Brevet Major General L. C., chief quartermaster Department of the Missouri, Fort Leavenworth, Kansas.

Van Vliet, Brevet Major General Stewart, chief quartermaster Military Division of the Atlantic, in charge of depot and Schuylkill Arsenal, Philadelphia, Pennsylvania.

McFerran, Brevet Brigadier General J. C., chief quartermaster Military Division of the South, Louisville, Kentucky.

Holabird, Brevet Brigadier General S. B., chief quartermaster Department of Dakota, Saint Paul, Minnesota.

Tyler, Brevet Major General R. O., chief quartermaster Military Division of the Pacific, San Francisco, California.

Tompkins, Brevet Brigadier General C. H., chief quartermaster Department of Arizona, Drum Barracks, California.

Ekin, Brevet Brigadier General J. A., chief quartermaster Department of Texas, San Antonio, Texas; on leave of absence.

Myers, Brevet Brigadier General Frederick, on leave of absence.

MAJORS AND QUARTERMASTERS.

Montgomery, Alexander, Buffalo, New York.
 Moore, Brevet Brigadier General Tredwell, Fort Adams, Rhode Island.
 Ransom, Brevet Lieutenant Colonel H. C., quartermaster District of Montana, and post quartermaster Fort Shaw, Montana Territory.
 Eddy, Brevet Colonel A. R., chief quartermaster Department of the South, Louisville, Kentucky.
 Saxton, Brevet Brigadier General Rufus, chief quartermaster Department of the Columbia, Portland, Oregon.
 Bingham, Brevet Brigadier General J. D., Quartermaster General's Office, Washington, D. C.
 Perry, Brevet Brigadier General A. J., chief quartermaster Department of the Platte, Omaha, Nebraska.
 Hodges, Brevet Lieutenant Colonel H. C., chief quartermaster third quartermaster's district, Department of the East, Philadelphia, Pennsylvania.
 Chandler, Brevet Colonel J. G., chief quartermaster second quartermaster's district, Department of the East, Boston, Massachusetts.
 Sawtelle, Brevet Brigadier General C. G., chief quartermaster Department of California, and in charge of depot, San Francisco, California.
 Dana, Brevet Brigadier General J. J., chief quartermaster Department of the Lakes, Detroit, Michigan.
 Potter, Brevet Brigadier General J. A., on sick leave.
 Batchelder, Brevet Colonel R. N., chief quartermaster first quartermaster's district, Department of the East, New York City.
 Ludington, Brevet Lieutenant Colonel M. I., Quartermaster General's Office, Washington, D. C.
 Moore, Brevet Lieutenant Colonel J. M., in charge of depot, Fort Leavenworth, Kansas.
 Belger, James, in charge of division depot, New Orleans, Louisiana.

CAPTAINS AND ASSISTANT QUARTERMASTERS.

Myers, Brevet Brigadier General William, in charge of depot, Washington, D. C.
 Thomas, Brevet Lieutenant Colonel C. W., settling his accounts, Washington, D. C.
 Enos, Brevet Colonel Herbert M., on sick leave.
 Card, Brevet Brigadier General B. C., in charge of depot, San Antonio, Texas.
 Reynolds, Brevet Lieutenant Colonel C. A., Fort D. A. Russell, Wyoming Territory.
 Dandy, Brevet Brigadier General G. B., Fort Abercrombie, Dakota Territory.
 Weeks, Brevet Lieutenant Colonel G. H., in charge of depot, Saint Louis, Missouri.
 Carling, Brevet Lieutenant Colonel E. B., Fort Monroe, Virginia.
 Hughes, William B., Corinne, Utah Territory.
 Robinson, Brevet Major A. G., Fort Hays, Kansas.
 Baker, Edward D., Camp Halleck, Nevada.
 Jones, Brevet Lieutenant Colonel H. W., in charge of depot, Fort Vancouver, Washington Territory.
 Inman, Brevet Lieutenant Colonel Henry, settling his accounts, Fort Abercrombie, Dakota Territory.
 Lee, Brevet Lieutenant Colonel J. G. C., in charge of depot, and chief disbursing officer southern district of Arizona, Tucson, Arizona Territory.
 Gillis, James, Chicago, Illinois.
 Eckerson, Brevet Major T. J., on sick leave.
 McGonnigle, Brevet Colonel A. J., in charge of depot, Fort Union, New Mexico, and acting chief quartermaster District of New Mexico, Santa Fé, New Mexico.
 Grimes, Brevet Major E. B., Fort Wingate, New Mexico.
 Scully, Brevet Colonel J. W., Ringold Barracks, Texas.
 Howell, Brevet Major W. T., Fort Griffin, Texas.
 Foster, Brevet Colonel C. W., in charge of depot, and chief disbursing officer northern district of Arizona, Fort Whipple, Arizona Territory.
 Bradley, George W., in charge of depot, Charleston, South Carolina.
 Alden, Brevet Major G. E., on leave of absence.
 Barstow, Brevet Lieutenant Colonel S. F., on duty as aide-de-camp, headquarters Military Division of the Atlantic, Philadelphia, Pennsylvania.
 Belcher, Brevet Major J. H., in charge of depot, Omaha, Nebraska.
 Kirk, Ezra B., Camp Supply, Indian Territory.
 Kimball, Amos S., Kit Carson, Colorado Territory.
 Rockwell, Brevet Lieutenant Colonel A. F., Fort Sill, Indian Territory.
 Smith, Gilbert C., post quartermaster, San Francisco, California.
 Hunt, Brevet Lieutenant Colonel T. B., Fort Davis, Texas.
 Strang, Brevet Lieutenant Colonel E. J., New Orleans, Louisiana, closing accounts.

Porter, David W., Fort Quitman, Texas.
 Constable, Nathaniel S., Fort Randall, Dakota Territory.
 Furey, John V., Sioux City, Iowa.
 Forsyth, Brevet Major L. C., en route to Fort Ellis, Montana Territory.
 Hoyt, Charles H., in charge of depot, Jeffersonville, Indiana.
 Blunt, Brevet Colonel A. P., Fort Buford, Dakota Territory.

CAPTAINS AND MILITARY STOREKEEPERS.

Potter, Reuben M., acting assistant quartermaster, Pittsburgh, Pennsylvania.
 Alligood, Charles A., acting assistant quartermaster, Baltimore, Maryland.
 Rodgers, John F., Jeffersonville, Indiana.
 Hull, Gustavus A., acting assistant quartermaster, Fort Sanders, Wyoming Territory.
 Dimpfel, George H. A., closing accounts at Camp Verde, Arizona Territory.
 Hodges, William G., awaiting orders, &c., at Galveston, Texas.
 Sawyer, Nathan D. A., acting assistant quartermaster, Indianola, Texas.
 Livers, John, Fort Leavenworth, Kansas.
 Lieber, Hamilton, Fort Snelling, Minnesota.
 Van Antwerp, Verplanck, Philadelphia, Pennsylvania.
 Barrett, Addison, San Francisco, California.
 Martin, William P., Charleston, South Carolina.



II.

QUARTERMASTER GENERAL'S OFFICE.

Meigs, Brevet Major General M. C., Quartermaster General; Allen, Brevet Major General Robert, assistant quartermaster general; Bingham, Brevet Brigadier General J. D., quartermaster; Ludington, Brevet Lieutenant Colonel M. I., quartermaster.

GENERAL DEPOTS, ESTABLISHED BY GENERAL ORDERS NO. 32, HEADQUARTERS ARMY.
 APRIL 8, 1869.

New York.—Ingalls, Brevet Major General Rufus, assistant quartermaster general, in charge.

Philadelphia and Schuylkill Arsenal, Pennsylvania.—Van Vliet, Brevet Major General Stewart, deputy quartermaster general, in charge; Van Antwerp, Captain Verplanck, military store-keeper.

Washington, D. C.—Myers, Brevet Brigadier General William, assistant quartermaster, in charge.

Jeffersonville, Indiana.—Hoyt, Captain C. H., assistant quartermaster, in charge; Rodgers, Captain J. F., military store-keeper.

MILITARY DIVISION OF THE ATLANTIC.

Headquarters Philadelphia, Pennsylvania.—Van Vliet, Brevet Major General Stewart, deputy quartermaster general, chief quartermaster.

Department of the East, headquarters New York City.—Ingalls, Brevet Major General Rufus, assistant quartermaster general, chief quartermaster; Moore, Brevet Brigadier General Tredwell, quartermaster, Fort Adams, Rhode Island; Hodges, Brevet Lieutenant Colonel H. C., quartermaster, Philadelphia, Pennsylvania; Chandler, Brevet Colonel J. G., quartermaster, Boston, Massachusetts; Batchelder, Brevet Colonel R. N., quartermaster, New York City; Carling, Brevet Lieutenant Colonel E. B., quartermaster, Fort Monroe, Virginia; Potter, Captain R. M., military storekeeper, Pittsburgh, Pennsylvania; Alligood, Captain C. A., military storekeeper, Baltimore, Maryland.

Department of the Lakes, headquarters Detroit, Michigan.—Dana, Brevet Brigadier General J. J., quartermaster, chief quartermaster; Montgomery, Major A., quartermaster, Buffalo, New York.

MILITARY DIVISION OF THE SOUTH.

Headquarters Louisville, Kentucky.—McFerran, Brevet Brigadier General J. C., deputy quartermaster general, chief quartermaster; Belger, Major James, quartermaster, New Orleans, Louisiana.

Department of the South, headquarters Louisville, Kentucky.—Eddy, Brevet Colonel A. R., quartermaster, chief quartermaster; Bradley, Captain G. W., assistant quartermaster, Charleston, South Carolina; Martin, Captain W. P., military store keeper, Charleston, South Carolina.

Department of Texas, headquarters San Antonio, Texas.—Ekin, Brevet Brigadier

General J. A., deputy quartermaster general, chief quartermaster, on leave of absence; Carl, Brevet Brigadier General B. C., assistant quartermaster, San Antonio, Texas; Scully, Brevet Colonel J. W., assistant quartermaster, Ringgold Barracks, Texas; Howell, Brevet Major W. T., assistant quartermaster, Fort Griffin, Texas; Alden, Brevet Major G. E., assistant quartermaster, Fort McIntosh, Texas, on leave of absence; Hunt, Brevet Lieutenant Colonel T. B., assistant quartermaster, Fort Davis, Texas; Strang, Brevet Lieutenant Colonel E. J., assistant quartermaster, New Orleans, Louisiana; Porter, Captain D. W., assistant quartermaster, Fort Quitman, Texas; Hodges, Captain W. G., military store-keeper, Galveston, Texas; Sawyer, Captain N. D. A., military store-keeper, Indianola, Texas.

MILITARY DIVISION OF THE MISSOURI.

Headquarters Chicago, Illinois.—Rucker, Brevet Major General D. H., assistant quartermaster general, chief quartermaster; Weeks, Brevet Lieutenant Colonel G. H., assistant quartermaster, St. Louis, Missouri; Gilliss, Captain James, assistant quartermaster, Chicago, Illinois.

Department of the Missouri, headquarters Fort Leavenworth, Kansas.—Easton, Brevet Major General L. C., deputy quartermaster general, chief quartermaster; Moore, Brevet Lieutenant Colonel J. M., quartermaster, Fort Leavenworth, Kansas; Robinson, Brevet Major A. G., assistant quartermaster, Fort Hays, Kansas; McGonigle, Brevet Colonel A. J., assistant quartermaster, Fort Union and Santa Fé, New Mexico; Grimes, Brevet Major E. B., assistant quartermaster, Fort Wingate, New Mexico; Kirk, Captain E. B., assistant quartermaster, Camp Supply, Indian Territory; Kimball, Captain A. S., assistant quartermaster, Kit Carson, Colorado Territory; Rockwell, Brevet Lieutenant Colonel A. F., assistant quartermaster, Fort Sill, Indian Territory; Livers, Captain John, military store-keeper, Fort Leavenworth, Kansas.

Department of the Platte, headquarters Omaha, Nebraska.—Perry, Brevet Brigadier General A. J., quartermaster, chief quartermaster; Reynolds, Brevet Lieutenant Colonel C. A., assistant quartermaster, Fort D. A. Russell, Wyoming Territory; Hughes, Captain W. B., assistant quartermaster, Corinne, Utah Territory; Belcher, Brevet Major J. H., assistant quartermaster, Omaha, Nebraska; Hull, Captain G. A., military store-keeper, Fort Sanders, Wyoming Territory.

Department of Dakota, headquarters St. Paul, Minnesota.—Holabird, Brevet Brigadier General S. B., deputy quartermaster general, chief quartermaster; Ransom, Brevet Lieutenant Colonel H. C., quartermaster, Fort Shaw, Montana Territory; Dandy, Brevet Brigadier General G. B., assistant quartermaster, Fort Abercrombie, Dakota Territory; Constable, Captain N. S., assistant quartermaster, Fort Randall, Dakota Territory; Furey, Captain J. V., assistant quartermaster, Sioux City, Iowa; Forsyth, Brevet Major L. C., assistant quartermaster, en route to Fort Ellis, Montana Territory; Blunt, Brevet Colonel A. P., assistant quartermaster, Fort Buford, Dakota Territory; Lieber, Captain H., military store-keeper, Fort Snelling, Minnesota.

MILITARY DIVISION OF THE PACIFIC.

Headquarters San Francisco, California.—Tyler, Brevet Major General R. O., deputy quartermaster general, chief quartermaster.

Department of California, headquarters San Francisco, California.—Sawtelle, Brevet Brigadier General C. G., quartermaster, chief quartermaster; Baker, Captain E. D., assistant quartermaster, Camp Halleck, Nevada; Smith, Captain G. C., assistant quartermaster, San Francisco, California; Barrett, Captain A., military store-keeper, San Francisco, California.

Department of Arizona, headquarters Drum Barracks, California.—Tompkins, Brevet Brigadier General C. H., deputy quartermaster general, chief quartermaster; Lee, Brevet Lieutenant Colonel J. G. C., assistant quartermaster, Tucson, Arizona Territory; Foster, Brevet Colonel C. W., assistant quartermaster, Fort Whipple, Arizona Territory; Dimpfel, Captain G. H. A., military store-keeper, Camp Verde, Arizona Territory.

Department of the Columbia, headquarters Portland, Oregon.—Saxton, Brevet Brigadier General Rufus, quartermaster, chief quartermaster; Jones, Brevet Lieutenant Colonel H. W., assistant quartermaster, Fort Vancouver, Washington Territory.

MISCELLANEOUS.

Myers, Brevet Brigadier General Frederick, deputy quartermaster general, on leave of absence; Porter, Brevet Brigadier General J. A., quartermaster, on leave of absence; Thomas, Brevet Lieutenant Colonel C. W., assistant quartermaster, settling accounts, Washington, D. C.; Enos, Brevet Colonel H. M., assistant quartermaster, on sick leave; Inman, Brevet Lieutenant Colonel Henry, assistant quartermaster, settling accounts, Fort Abercrombie, Dakota Territory; Eckerson, Brevet Major T. J., assistant quartermaster, on sick leave; Barstow, Brevet Lieutenant Colonel S. F., assistant quartermaster, on duty as aide-de-camp at headquarters Military Division of the Atlantic, Philadelphia, Pennsylvania.

Annual report of officers of the Quartermaster's Department for the fiscal year ending June 30, 1871.

No.	Name and grade.	Rank.	Duties, &c.	
QUARTERMASTER GENERAL.				
1	Montgomery C. Meigs.....	Brigadier general and brevet major general	In charge of the Quartermaster's Department at Washington, D. C.	
ASSISTANT QUARTERMASTER GENERALS.				
1	Robert Allen.....	Colonel and brevet major general	On duty in the Quartermaster General's office at Washington, D. C. Chief quartermaster Military Division of the Missouri, and from March 1 to June 21, 1871, in charge of depot at Chicago, Ill. Chief quartermaster Department of the East and in charge of depot at New York City.	
2	Daniel H. Rucker.....	Colonel and brevet major general		
3	Rufus Ingalls.....	Colonel and brevet major general		
DEPUTY QUARTERMASTER GENERALS.				
1	Langdon C. Easton.....	Lieutenant colonel and brevet major general	Chief quartermaster Department of the Missouri, at Fort Leavenworth, Kansas. Chief quartermaster Military Division of the Atlantic in charge of Philadelphia depot and the clothing depot at Schuylkill arsenal. Chief quartermaster Military Division of the South, at Louisville, Ky. Chief quartermaster Department of Dakota, at St. Paul, Minn. Chief quartermaster Military Division of the Pacific, at San Francisco, Cal. From July 1 to October 3, 1870, engaged in closing business pertaining to late Department of Alaska, at Sitka, Alaska; to December 25 en route and on special duty at San Francisco, Cal., and thenceforward chief quartermaster Department of Arizona, at Drum Barracks, Cal. Chief quartermaster Department of Texas, stationed at Austin, Texas, to October 27, 1870; thenceforward at San Antonio, Texas; from 27th to 30th of June on leave of absence. In charge of division depot at New Orleans, La., to April 26, 1871; thenceforward awaiting orders and on leave of absence.	
2	Stewart Van Vliet.....	Lieutenant colonel and brevet major general		
3	John C. McFerran.....	Lieutenant colonel and brevet brigadier general		
4	Samuel B. Holabird.....	Lieutenant colonel and brevet brigadier general		
5	Robert O. Tyler.....	Lieutenant colonel and brevet major general		
6	Charles H. Tompkins.....	Lieutenant colonel and brevet brigadier general		
7	James A. Ekin.....	Lieutenant colonel and brevet brigadier general	Quartermaster at Buffalo, N. Y., and in charge of the Quartermaster's Department at the various posts in western New York. Post quartermaster at Fort Adams, R. I. To December 7 on leave of absence, special duty, awaiting orders, en route, &c., to February 27 assistant to chief quartermaster Department of Dakota, at St. Paul, Minn., and from March 11 chief quartermaster District of Montana and post quartermaster at Fort Shaw, M. T. Chief quartermaster Department of the South; stationed at Atlanta, Ga., to February 8, 1871; thenceforward at Louisville, Ky. Chief quartermaster Department of the Columbia, at Portland, Oregon. On duty in the Quartermaster General's office, at Washington, D. C. Chief quartermaster Department of the Platte, at Omaha, Nebraska. Chief quartermaster third quartermaster's district, Department of the East, at Philadelphia, Pa.	
8	Frederick Myers.....	Lieutenant colonel and brevet brigadier general		
QUARTERMASTERS.				
1	Alexander Montgomery.....	Major		
2	Tredwell Moore.....	Major and brevet brigadier general		
3	Hyatt C. Ransom.....	Major and brevet lieutenant colonel		
4	Asahel R. Eddy.....	Major and brevet colonel		
5	Rufus Saxton.....	Major and brevet brigadier general		
6	Judson D. Bingham.....	Major and brevet brigadier general		
7	Alexander J. Perry.....	Major and brevet brigadier general		
8	Henry C. Hodges.....	Major and brevet lieutenant colonel		

9	John G. Chandler	Major and brevet colonel	Chief quartermaster second quartermaster's district, Department of the East, at Boston, Mass.
10	Charles G. Sawtelle	Major and brevet brigadier general	Chief quartermaster, Department of California, at San Francisco, Cal.; in addition to which, from October 17, 1870, in charge of depot.
11	James J. Dana	Major and brevet brigadier general	Chief quartermaster, Department of the Lakes, at Detroit, Mich.
12	Joseph A. Potter	Major and brevet brigadier general	To September 1, 1870, on leave of absence, en route, &c.; to April 27, 1871, chief quartermaster District of New Mexico, at Santa Fe, N. M.; thence, forward on leave of absence.
13	Richard N. Batchelder	Major and brevet colonel	Chief quartermaster first quartermaster's district, Department of the East, at New York City.
14	Marshall I. Ludington	Major and brevet lieutenant colonel	On duty in the Quartermaster General's office, at Washington, D. C.
15	James M. Moore	Major and brevet lieutenant colonel	Depot quartermaster at Fort Leavenworth, Kansas.
16	James Belger	Major	Appointed April 13, 1871; to May 13 awaiting orders, en route, &c.; thence, forward in charge of depot at New Orleans, La.
ASSISTANT QUARTERMASTERS.			
1	William Myers	Captain and brevet brigadier general	In charge of depot at Washington, D. C.
2	Charles W. Thomas	Captain and brevet lieutenant colonel	To January 15, 1871, post quartermaster at Fort Monroe, Va.; thenceforward settling accounts at Washington, D. C.
3	Herbert M. Enos	Captain and brevet colonel	During year sick at Waukesha, Wis.
4	Benjamin C. Card	Captain and brevet brigadier general	In charge of depot at San Antonio, Texas.
5	Charles A. Reynolds	Captain and brevet lieutenant colonel	In charge of depot at Fort D. A. Russell, Wyoming Territory.
6	George B. Dandy	Captain and brevet brigadier general	To March 3, 1871, transferring property, on leave of absence, en route, &c.; thenceforward depot and post quartermaster at Fort Abercrombie, D. T.
7	George H. Weeks	Captain and brevet lieutenant colonel	In charge of depot at St. Louis, Mo.
8	Elias B. Carling	Captain and brevet lieutenant colonel	To March 17, 1871, chief quartermaster District of Montana and post quartermaster, &c.; thence forward post quartermaster at Fort Monroe, Va.
9	William B. Hughes	Captain	To October 17, 1870, depot quartermaster, in charge of clothing &c.; to April 1, 1871, post quartermaster and assistant to depot quartermaster at San Francisco, Cal.; to May 27 transferring property, en route, &c.; thenceforward on duty at Corlume, Utah.
10	Augustus G. Robinson	Captain and brevet major	To September 1, 1871, chief quartermaster District of New Mexico, at Santa Fe, N. M.; from October 1, post quartermaster at Fort Hays, Kansas.
11	Edward D. Baker	Captain	To August 8, 1870, awaiting orders, en route, &c.; to November 15 depot and post quartermaster at Fort Vancouver, W. T.; from December 8 post quartermaster at Camp Halleck, Nevada.
12	Henry W. Jones	Captain and brevet lieutenant colonel	To September 14, 1870, settling accounts at Washington, D. C. and en route; thenceforward to June 30 on duty at Portland, Oregon, when he assumed charge of depot at Fort Vancouver, W. T.
13	Henry Iman	Captain and brevet lieutenant colonel	To September 1, 1870, in arrest, en route, &c.; to November 3 post quartermaster at Fort Abercrombie, D. T.; thenceforward in arrest, en route, and settling accounts at Fort Abercrombie, D. T.
14	James G. C. Lee	Captain and brevet lieutenant colonel	In charge of depot and chief disbursing officer Southern District of Arizona, at Tucson, Arizona, Ter.
15	James Gilliss	Captain	To March 1, 1871, on duty at Chicago, Ill.; thenceforward on leave of absence and on special duty in Department of Dakota, to June 21, 1871, when he resumed duties as purchasing and disbursing quartermaster at Chicago, Ill.
16	Theodore J. Eckerson	Captain and brevet major	To August 11, 1870, post quartermaster at Jefferson, Texas; to November 30, en route and post quartermaster at Waco, Texas; from December 1 to April 15, 1871, post quartermaster at Fort Richardson, Texas; thence, forward to June 30, 1871, transferring and on leave.

Annual report of officers of the Quartermaster's Department for the fiscal year ending June 30, 1871.—Continued.

No.	Name and grade.	Rank.	Duties, &c.
ASSISTANT QUARTERMASTERS—Cont'd.			
17	Andrew J. McGonnigle.....	Captain and brevet colonel.....	In charge of depot at Fort Union, N. M.; and from April 17, 1871, also acting chief quartermaster, District of New Mexico, at Santa Fe, N. M.
18	Edward B. Grimes.....	Captain and brevet major.....	Post quartermaster at Fort Wingate, N. M.
19	James W. Sully.....	Captain and brevet colonel.....	Post quartermaster at Ringgold Barracks, Texas.
20	William T. Howell.....	Captain and brevet major.....	To August 1 en route; thence forward post quartermaster at Fort Griffin, Texas.
21	Charles W. Foster.....	Captain and brevet colonel.....	In charge of depot and chief disbursing officer Northern District of Arizona, at Fort Whipple, A. T.
22	George W. Bradley.....	Captain.....	In charge of depot at Charleston, S. C.
23	George E. Alden.....	Captain and brevet major.....	To August 6, 1870, en route, &c.; post quartermaster at Fort McIntosh, Texas, to June 16, 1871; thenceforward en route to New Orleans, La., and on leave of absence.
24	Simon F. Barstow.....	Captain and brevet lieutenant colonel.....	Aide-de-camp at head-quarters Military Division of the Atlantic, Philadelphia, Pa.
25	John H. Belcher.....	Captain and brevet major.....	In charge of depot at Omaha, Neb.
26	Ezra B. Kirk.....	Captain.....	Post quartermaster at Camp Supply, I. T.
27	Amos S. Kimball.....	Captain.....	To September 3, on leave of absence; to March 14 awaiting orders, on trial by court martial, &c.; thenceforward on duty at Kit Carson, C. T.
28	Almon F. Rockwell.....	Captain and brevet lieutenant colonel.....	Post quartermaster at Fort Sill, I. T.
29	Gilbert C. Smith.....	Captain.....	To September 1, 1870, settling accounts at Washington, D. C., to October 9, awaiting orders, en route, &c.; to December 28, on duty at Corinne, Utah Territory; to April 1, en route and awaiting orders; thenceforward post quartermaster, and to June, 1871, also assistant to depot quartermaster at San Francisco, Cal.
30	Thomas B. Hunt.....	Captain and brevet lieutenant colonel.....	To September 21, 1870, in charge of depot at Austin, Texas; to December 27, transferring property, en route, &c.; thenceforward post quartermaster at Fort Davis, Texas.
31	Edward J. Strang.....	Captain and brevet lieutenant colonel.....	To April 26, 1871, on duty at New Orleans, La., where, to May 13, in charge of depot, and from May 13 to 19, disbursements; during remainder of fiscal year making transfers and closing accounts at that place.
32	David W. Porter.....	Captain.....	To November 23, engaged in the purchase of cavalry horses at San Antonio, Texas; to December 31, transferring property, and en route; thenceforward post quartermaster at Fort Quilman, Texas.
33	William A. Wainwright.....	Captain.....	To September 9, on leave of absence, when resignation accepted.
34	Nathaniel S. Constable.....	Captain.....	To October 10, 1870, post quartermaster at Fort Buford, D. T., from October 31, post quartermaster at Fort Randall, D. T.
35	Samuel B. Landfor.....	Captain.....	To December 31, 1870, on sick leave; resignation accepted to date January 1, 1871.
36	John V. Furey.....	Captain.....	In charge of depot at Sioux City, Iowa.
37	Levia C. Forsyth.....	Captain and brevet major.....	To June 1, 71, settling accounts at Washington, D. C.; thenceforward en route.
38	Charles H. Hoyt.....	Captain.....	In charge of depot at Jeffersonville, Ind.
39	Ann P. Blunt.....	Captain and brevet colonel.....	To October 10 on leave of absence, en route, on special duty, &c.; thenceforward post quartermaster at Fort Buford, D. T.

MILITARY STORE-KEEPERS.

1	Renben M. Potter	Captain.	Acting assistant quartermaster at Pittsburgh, Pa.
2	William H. Gill	Captain.	To September 1, 1870, at Schuylkill Arsenal, Philadelphia, Pa.; thence forward to December 16, transferring property, &c.; when resignation accepted.
3	Daniel G. Thomas	Captain.	To November 8, 1870, acting assistant quartermaster at Camp Douglas, Utah Territory, on which date he died.
4	Charles A. Allgood	Captain.	To September 27, at Fort Monroe, Va., from which date acting assistant quartermaster at Baltimore, Md.
5	John F. Rodgers	Captain.	To August 13 acting assistant quartermaster at Fort Harker, Kansas; from September 1, on duty at Jeffersonville, Ind.
6	Gustavus A. Holl	Captain.	To September 7, on duty at Jeffersonville, Ind.; to December 13, transferring property, awaiting orders, en route, &c.; to February 15, acting assistant quartermaster at Fort D. A. Russell, W. T.; to March 22 awaiting orders, en route, &c.; thenceforward acting assistant quartermaster at Fort Sanders, W. T.
7	George H. A. Dimpfel	Captain.	To January 30, 1871, awaiting orders at Sitka, Alaska, en route, &c.; to April 10, acting assistant quartermaster at Camp Verde, A. T.; thenceforward arranging his accounts.
8	William G. Hodges	Captain.	To August 6, transferring property, &c., at New Orleans, La.; from August 18, 1870, to April 12, 1871, acting assistant quartermaster at Galveston, Texas; thenceforward awaiting orders.
9	John Craig	Captain.	To January 1, 1871, (when resignation accepted,) acting assistant quartermaster at New San Diego, Cal.
10	Nathan D. A. Sawyer	Captain.	To September 13, 1870, awaiting orders, en route, &c.; thenceforward acting assistant quartermaster at Indianola, Texas.
11	John Livers	Captain.	Fort Leavenworth, Kansas.
12	Hamilton Lieber	Captain.	To August 9, 1870, on sick leave, en route, &c.; thenceforward on duty at Fort Snelling, Minn.
13	Verplanck Van Antwerp	Captain.	To September 1, awaiting orders, &c.; thenceforward on duty at Schuylkill Arsenal, Philadelphia, Pa.
14	Addison Barrett	Captain.	To October 13, on duty at Charleston, S. C.; to December 31, transferring property, en route, &c.; thenceforward on duty at San Francisco, Cal.
15	William P. Martin	Captain.	To August 11, 1870, on duty at Fort Snelling, Minn.; to October 13, transferring property, on special duty, en route, &c.; thenceforward on duty at Charleston, S. C.

RECAPITULATION.

Grade.	In service at commence- ment of fis- cal year.	Appointed.	Resigned.	Died.	In service at end of fiscal year.
Quartermaster General, with rank of brigadier general.....	1				1
Assistant quartermaster generals, with rank of colonel.....	3				3
Deputy quartermaster generals, with rank of lieutenant colonel.....	8				8
Quartermasters, with rank of major.....	15	1			16
Assistant quartermasters, with rank of captain.....	39		2		37
Military store-keepers, with rank of captain.....	15		2	1	12
Total.....	81	1	4	1	77

QUARTERMASTER GENERAL'S OFFICE,
Washington, D. C., September 30, 1871.

GENERAL: I have the honor to submit a report of the duties discharged by the accounts branch since the last annual report.

This branch keeps the accounts of appropriations for the Quartermaster's Department, showing at all times the amount subject to draft; receives and records the money accounts and property returns of officers; receives, examines, and files the monthly and quarterly reports; examines the accounts of disbursements, recording in detail the expenditures under the several appropriations; indorses on accounts and returns the action thereon, advising officers of irregularities and discrepancies, and of all suspensions and disallowances in their accounts; and, in general, conducts the correspondence relating to money and property responsibility.

On July 1, 1870, the balance of appropriations of the Quartermaster's Department in the Treasury, undrawn, was, by report of last year..	\$1, 282, 473 22
Amount to the credit of appropriations from deposits derived principally from sales during the year, of public property purchased from appropriations of former years.....	1, 078, 065 63
Add sums which, having been expended by this Department, have been refunded by other Departments	349, 711 66
	<hr/> 2, 710, 250 51
Requisitions on account of settlements made at the Treasury of claims and accounts.....	1, 812, 234 24
	<hr/> 898, 016 27
Balance July 1, 1871, of appropriations of the Quartermaster's Department for years prior to July 1, 1870	

Appropriation for fiscal year ending June 30, 1871, act of Congress of July 15, 1870.....	\$11, 400, 000 00
Appropriations for deficiencies, act of March 3, 1871...	1, 050, 000 00
Amount refunded during the year on account of over-payments	25 00
	<hr/> 12, 450, 025 00
Remittances to officers for disbursement on requests of the Quartermaster General.....	12, 072, 891 22
Requisitions by the Secretary of War on requests of the Pay Department	155, 000 00
Requisitions on account of settlements made at the Treasury of claims and accounts.....	222, 133 78
	<hr/> 12, 450, 025 00

The accounts and vouchers which have passed the administrative examination of this office, and been transmitted to the Treasury for final examination and settlement since the last annual report, show disbursements from appropriations of years prior to the fiscal year ending June 30, 1871, amounting to..... \$34, 038, 936 89
In the fiscal year ending June 30, 1871..... 612, 940 36

Total	34, 651, 877 25
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Appropriations are charged with these disbursements as follows:

1. Appropriations for the Quartermaster's Department, viz:

Regular supplies	\$9, 923 633 18
Incidental expenses	3, 559, 573 00
Purchase of cavalry and artillery horses.....	939 567 08
Barracks and quarters.....	5, 878 130 04
Transportation of the Army.....	12, 129, 849 19
Mileage, transportation of officers and baggage.....	542 276 58
Material for, and amount expended in the purchase and preparation of, clothing, camp and garrison equipage	323, 732 78
Purchase of stoves	202, 605 57
National cemeteries	1, 033, 428 05
	<hr/> 34, 532, 795 47

2. Special appropriations and expenditures for other Departments, viz

Medical Department	\$4,779 50	
Ordnance Department	80 24	
Subsistence Department	106 28	
Pay Department	255 98	
Bureau of Indian Affairs	35,194 59	
Bureau of Refugees, Freedmen and Abandoned Lands.....	36,138 77	
Army contingencies	11,510 79	
Military telegraphs	7,559 22	
Transportation, &c., of prisoners of war.....	6 35	
Reconstruction service	8,833 62	
Care, &c., of sick and disabled soldiers.....	94 64	
Collecting, drilling, and organizing volunteers.....	1,243 60	
Twenty per cent. additional compensation.....	217 80	
Hospital tax fund.....	13,060 40	
		<u>\$119,081 78</u>
Total disbursements exhibited by the accounts examined during the past year		<u>34,651,877 25</u>

The accounts examined since the last annual report, from which the above statement is made, number 6,401. The number examined in the previous year, as shown by the last annual report, was 1,754, covering disbursements to the amount of \$11,132,157 02. Of the unexamined accounts, numbering 5,055, 26 relate to disbursements in the year 1868, 435 in the year 1869, 2,637 in the year 1870, and 1,957 in the year 1871. The number of property returns examined during the year is 16,419, embracing vouchers to the number of about 195,000. The number examined in the preceding year was 7,475. The number remaining in the files of the office unexamined at this date is 7,815, of which 146 pertain to the year 1868, 1,674 to the year 1869, 4,091 to the year 1870, and 1,904 to the year 1871.

The unexamined accounts for 1868 and 1869 are those of regular disbursing officers of the Department, all accounts of acting assistant quartermasters for the period having been disposed of. These are now under examination, and will be forwarded to the Treasury as soon as possible.

All accounts subsequent to February, 1869, have received a preliminary examination, and, as the officers have been advised of all obvious errors and been allowed ample opportunity to correct them, much correspondence will be avoided in future, and the work of settlement materially facilitated. The accounts of all officers who left the service under the act of Congress approved July 15, 1870, reorganizing the Army, have been adjusted in this office. In addition to this, 95 settlements have been made under the act of Congress approved June 23, 1870, authorizing the settlement of accounts suspended on account of loss of funds, vouchers, &c., originating since the commencement of the late war and prior to August, 1866. The amount covered by these settlements is \$43,814 21. The whole number of final settlements made during the year is 479.

The examination of accounts and returns has been very much in arrears for many years, the small clerical force available for that purpose being entirely inadequate for the work; but the amount accomplished during the past year seems to indicate that in one year from this date the work will be practically up to date.

Fifty-one clerks are employed in this branch of the office—one of class four; four of class three; seven of class two, and thirty-nine of class one. It will be seen that nearly four-fifths of the entire number are in the lowest grade, and that in the ordinary course of events a meritori-

ous clerk may remain in the faithful discharge of highly responsible duties for years without promotion. As an inevitable consequence of this the office loses the services of many of the most valuable clerks of the lower grades, who leave the service entirely, or seek positions in offices which afford better chances for recognition and advancement.

I have the honor to suggest that the efficiency of this important branch of the office would be greatly increased by the readjustment of the grades in such a manner as to make promotion possible as the reward of faithful service. To effect a better organization of the branch I would recommend that an addition of two clerks of class four, two of class three, and four of class two, be made, and that a corresponding decrease be made in the number now in class one.

I am, very respectfully, your obedient servant,

J. D. BINGHAM,

Quartermaster, United States Army.

To the QUARTERMASTER GENERAL.

QUARTERMASTER GENERAL'S OFFICE,
Washington, D.C., September 27, 1871.

GENERAL: I have the honor to report that the principal work performed by this branch of your office during the past fiscal year has been the distribution of clothing and equipage from the depots at Philadelphia, Pennsylvania, and Jeffersonville, Indiana, to the different posts and garrisons throughout the country; the manufacture and purchase of a supply of such articles of clothing and equipage as had become exhausted; and the care and preservation of the large stock on hand at the depots by overhauling and setting apart that found to be still good and serviceable.

The clothing found unserviceable has from time to time been submitted to the action of an inspector, and generally sold at auction.

Recently, under special authority from the War Department, the larger portion of the condemned clothing and equipage, as well as a quantity of surplus materials, have been ordered sold at the Philadelphia and Jeffersonville depots, and it is estimated that about \$1,600,000 will be realized from these sales.

In order to secure the highest prices, the officers charged with the duty of conducting these sales have been specially instructed to sell only small lots at a time, thus insuring competition from small dealers.

The amount received from sales of this kind during the last fiscal year was \$379,728 84; this sum does not include, however, the amounts received from sales to officers of the Army for their own use, of which no special record is kept in this office.

The expenses connected with the purchase and manufacture, repacking and assorting the clothing and equipage in store, were \$201,143 12. It will thus be seen that a surplus of \$178,585 72 was covered into the Treasury of the United States.

Congress having made no appropriation for the purchase and manufacture of clothing, &c., during the last fiscal year, and prohibited the use of unexpended balances, this branch has been somewhat embarrassed in supplying the larger sizes of garments required by the enlisted men of the Army. It therefore became necessary to issue with the smaller sizes in store a quantity of material for enlarging them.

The necessity for this measure ceased as soon as the amount appropri-

ated by the passage of the deficiency bill became available, and the supplies are now issued as called for in the requisitions.

As indicated in the last annual report, all the knapsacks on hand in the Quartermaster's Department have deteriorated to such an extent as to become unserviceable and unfit for issue. Steps have been taken to furnish the Army with a new supply of knapsacks as well as haversacks.

In March last the chief quartermaster of the Military Division of the Pacific was instructed to procure by purchase, in Alaska, 2,000 hair seal-skins, at an estimated cost of not over 25 cents each, to be used in covering knapsacks, instead of painted canvas as heretofore. It is presumed that they are now in process of manufacture, and when completed will be distributed for trial.

Two thousand leather knapsacks, of a pattern selected by the General of the Army, from various models submitted to the Quartermaster's Department have also been purchased by contract. They are now being issued from the depot at Philadelphia, and the officers to whom they are supplied are called upon to report to this office the result of their trial.

A supply of haversacks, made of enameled cloth, is also now being procured.

Various complaints have been received from the Department of Arizona as to the quality of boots issued in that department. These boots were purchased in 1864; and in order to ascertain the extent of the deterioration complained of, several pairs were ordered to be sent to this office for examination and comparison with such as were purchased during the latter part of the fiscal year ending June 30, 1871.

From a careful trial on the testing machine, it appears that the boots are still good and serviceable, although not quite as strong as those recently purchased.

No complaints have been received from other departments, and it is believed that the supposed defects are attributable to the stony and rocky country of Arizona. Instructions have been given to have the soles of the boots issued in those regions studded with broad-headed nails.

The stock of boots and booties of small sizes having become exhausted, a supply is now being purchased by contract. One-half of the quantity to be procured will be of the kind known as hair-wire screw, and it is thought that they will be superior to the sewed.

During the last few years the Government has sustained great losses from damage to clothing and equipage by moths and mildew. Constant efforts have been made to prevent such losses by overhauling, repacking, use of petroleum paper, &c., but without success. During the year some articles of clothing and equipage have been subjected to a process which it is claimed renders them both moth and mildew proof. It is hoped that by next year the result of this experiment can be favorably reported upon.

Only six claims for clothing and equipage, &c., purchased and seized for use of the Army, amounting in the aggregate to \$9,165 05, have been received during the last fiscal year. All have been acted upon; those not finally adjusted being retained for further evidence.

The clerical force of this branch at the beginning of the last fiscal year consisted of 18 clerks and 3 laborers, and I am able to state that, notwithstanding the reduction of the force to 12 clerks and 2 laborers, made necessary by their transfer to another branch of this office where the work was greatly in arrear, the work of this branch which did not correspondingly decrease has been brought up to date, and is now being disposed of as fast as received.

The number of returns of officers on hand and not examined, on the 30th of June, 1870, was 1,338; 5,585 returns were received during the last fiscal year, and 6,805 were examined and transmitted to the Treasury Department, leaving on hand on the last day of June, 1871, only 118 returns. In addition, 4,630 letters have been received, and 11,261 letters written, including the correspondence with reference to the purchase, manufacture, distribution, and sale of supplies.

The supply of most of the articles of clothing and equipage on hand is considered sufficient for the wants of the Army for the coming year; it is estimated that about \$900,000 will be required for purchase and manufacture to replace such of the articles as may become exhausted, including a limited amount necessary for the preservation of the stock on hand.

The tabular statements accompanying this report furnish a detailed account of the business of the office, viz:

1. Statement showing, as far as can be ascertained from the records of this office, the quantity of clothing, camp and garison equipage and clothing materials in the hands of officers of the Army, June 30, 1870; the quantity of clothing and equipage purchased, manufactured, sold, lost, and issued to the Army of the United States during the fiscal year ending June 30, 1871; and the quantity remaining on hand for the supply of the Army at that date.

2. Statement of expenditures on account of clothing and equipage and materials, at the principal clothing depots, during the fiscal year ending June 30, 1871.

3. Statement of amounts received from the sale of surplus serviceable, damaged, and irregular articles of clothing and equipage and materials, at the principal clothing depots, during the fiscal year ending June 30, 1871.

4. Statement of claims for property purchased and seized for use of the Army, received and acted upon, during the fiscal year ending June 30, 1871.

5. Statement of officers' returns of clothing and equipage received, examined, and transmitted to the Treasury Department during the fiscal year ending June 30, 1871.

Very respectfully, your obedient servant,

J. D. BINGHAM,

Quartermaster, U. S. A.

Brigadier General M. C. MEIGS,

Quartermaster General, U. S. A.,

Washington, D.C.

A.—Statement showing, as far as can be ascertained from the records of this office, the quantity of clothing, camp and garrison equipage, and clothing material, in the hands of officers of the Army, June 30, 1870, the quantity of clothing and equipage purchased, manufactured, sold, lost, and issued to the Army of the United States during the fiscal year ending June 30, 1871, and the quantity remaining on hand for the supply of the Army at that date.

Articles.	On hand June 30, 1870.*	Purchased.	Manufactured.	Taken up.	Total.	Issued to enlisted men.	Sold.	Lost, condemned, and	Total.	Total remaining on hand June 30, 1871.
Hats	336,941	1		377	337,319	24,679	16,314	310	41,373	286,016
Uniform caps	2,432			30	2,462	2,929	139	10	3,068	2,104
Foragecaps	463,330			1,001	464,331	39,142	5,603	405	45,155	419,176
Cap-covers	94,399			46	94,445		29,934	1,098	31,032	63,413
Cap-buckles	403,272			5,941	409,213		11,242	10,653	21,905	387,308
Cap-letters	1,154,559			2,675	1,157,234		32,734	12,951	45,615	1,111,619
Shells	14,227			834	15,071		709	101	870	14,201
Shells and flanges	19,946				19,946		169	79	248	19,738
Cords and tassels	607,693			4,973	611,966	17,331	7,851	2,951	27,443	584,523
Ostrich-feathers	356,870			3,596	360,396	18,680	8,436	1,097	22,713	337,683
Knives	544,621			5,596	550,217		8,436	5,297	13,733	536,487
Numbers	1,614,604	10,000		6,644	1,631,252		36,278	23,870	60,146	1,571,106
Crossed sabres	211,757			9,997	221,754		5,171	5,171	13,114	1,995,540
Crossed cannon	154,114			3,079	157,193		7,934	1,854	9,168	151,003
Trumpets	116				116					116
Talipes	3,749			185	3,934		275		310	3,664
Hair-plumes	9,367			9	9,376	293	17	1	301	9,077
Cap-plumes	5,013				5,013		362	66	428	4,585
Hospital stewards' hat cords and tassels	2,850			2,850	2,850	2		3	5	2,845
Letters U. S. hospital stewards'	355			355	355		6	0	12	343
Wraps, hospital stewards'	261				261		4	3	11	250
Bands and tassels, red	1,362			84	1,446	102	19	104	220	1,217
Cap-cords	2,036			237	2,273		3	103	106	2,170
Hat-cords	71,034				71,034		71		71	70,963
Cap-plates	271			56	327					327
Uniform coats:										
Privates	7,636				7,636		22,950		34,710	7,656
Privates	369,474		25	430	369,923	11,149		611		358,773
Metallic scales:										
Non-commissioned staff	5,474			56	5,530		118	81	199	5,331
Sergeants	12,709			76	12,785		598	686	1,284	11,501
Corporals and privates	417,131			1,704	418,835		8,076	7,385	15,461	403,354
Buttons	11,330				11,330		1,064	132	1,196	9,534

Sashes.....	15, 007	54	15, 061		948	306	614	14, 447
Uniform jackets:								
Cavalry.....	7, 908		7, 908					7, 908
Artillery.....	485, 863	187	486, 050	5, 515	10, 202	199	94, 916	461, 134
Miscellaneous.....					373		373	
Trowsers:								
Foot.....	485, 705	518	488, 735	77, 180	21, 474	1, 155	99, 409	388, 926
Mounted.....	186, 964	582	190, 172	32, 833	6, 162	474	39, 469	150, 703
Overalls.....	13, 421		13, 436	2, 687	45	39	2, 731	10, 715
Flannel sack-coats:								
Lined.....	532, 786	5	532, 985	67, 715	4, 504	1, 637	73, 856	479, 129
Unlined.....	429, 202	150	432, 976	10, 643	2, 706	180	13, 529	416, 447
Shirts:								
Flannel.....	890, 375	2	890, 964	110, 980	89, 825	1, 849	202, 654	688, 310
Knit.....	48, 140	300	48, 577	1, 866	41, 466	28	43, 360	5, 217
Drawers.....	1, 026, 936	3, 722	1, 032, 371	147, 794	20, 944	950	169, 688	862, 563
Boots.....	272, 827	881	274, 196	47, 375	6, 634	9934	55, 007	219, 189
Bootees.....	904, 765	126	906, 593	80, 853	27, 404	5744	108, 8314	797, 762
Leggins.....	8, 791		8, 804	82	2	1214	8, 3024	8, 3024
Gaiters.....	3, 821		3, 821					3, 821
Stockings.....	837, 553	1, 002	839, 418	209, 646	31, 404	1, 711	242, 761	596, 647
Leather stocks.....	219, 822		221, 892	14, 553	50, 679	242	65, 474	156, 418
Great-coats:								
Cavalry.....	183, 221		183, 514	8, 641	2, 498	200	11, 339	172, 175
Infantry.....	430, 814	53	430, 867	21, 920	13, 364	454	35, 956	394, 909
Straps.....	844, 865		845, 492	29, 429	2, 516	1, 640	33, 545	811, 307
Blankets:								
Woolen.....	342, 643	2, 000	344, 754	43, 573	88, 659	7, 054	139, 286	205, 468
Rubber.....	477, 848		479, 089	3, 183	38, 550	1, 805	42, 538	436, 551
Ponchos:								
Rubber.....	364, 470		365, 042	4, 505	20, 798	1, 760	27, 063	337, 979
Painted.....	5, 692		5, 772	21	3, 282	18	3, 331	2, 551
Stable frocks.....	51, 637	90	51, 729	10, 695	422	96	11, 143	40, 346
Buffalo overshoes.....	6, 452		6, 452	2, 942	7544	83	3, 779	2, 673
Buffalo overcoats.....	411		411		3		3	408
Mittens, wool.....	25, 748		25, 878	5, 636	215	54	5, 905	19, 973
Mittens, buck.....	823		823	84	19		5, 103	720
Chevrans:								
Ordnance sergeant.....	430		438	25	3	1	29	409
Cavalry sergeant major.....	1, 390		1, 390	7	2	10	19	1, 371
Cavalry quartermaster sergeant.....	2, 030		2, 030	6	18		24	2, 006
Cavalry commissary sergeant.....	34		34				1	33
Cavalry first sergeant.....	4, 215		4, 215	14	55	6	75	4, 140
Cavalry sergeant.....	11, 885	2	11, 887	290	63	172	475	11, 412
Cavalry corporal.....	25, 215		25, 215	217	61	8	296	24, 929
Cavalry sergeant major.....	1, 248		1, 248	2	3		5	1, 243
Artillery quartermaster sergeant.....	1, 258		1, 258	1	1		1	1, 257
Artillery quartermaster sergeant.....	3, 32		3, 32					32
Artillery commissary sergeant.....	3, 367		3, 367	2	5	3	10	3, 377
Artillery first sergeant.....	14, 094		14, 119	44	4	40	88	14, 031
Artillery sergeant.....	17, 963		17, 963	45	3		43	17, 915
Artillery corporal.....								

Statement showing the quantity of clothing, camp and garrison equipage, and clothing material, in the hands of officers of the Army, &c.—Continued.

Articles.	On hand June 30, 1870.	Purchased.	Manufactured.	Taken up.	Total.	Issued to enlisted men.	Sold.	Lost, expended, and condemned.	Total.	Total remaining on hand June 30, 1871.
Chevrans—Continued:										
Infantry sergeant-major.....	1,630				1,630	16	34	9	52	1,578
Infantry quartermaster sergeant.....	1,832		50	12	1,904	11	50	158	220	1,683
Infantry commissary sergeant.....	11,526				11,526		5		5	11,521
Infantry first sergeant.....	33,397			5	33,402	80	78	32	900	32,499
Infantry sergeant.....	30,332			49	30,381	759	491	223	1,403	28,978
Infantry corporal.....	463			79	542	902	602		1,504	38,107
Hospital steward.....	468				468					468
Caliceus.....	72,336				72,336	114	23	2	69	72,280
Service.....	43,061			6	43,067	115	36	31	146	42,884
Miscellaneous.....	394,380				394,380	985	4,540	4,844	19,229	306,307
14-inch, sergeants'.....	565,611	964		182	576,655	2,119	2,312	1,814	12,463	563,346
14-inch, corporals.....	1,191,324			10,400	1,201,724	2,853	570	70	3,493	1,198,238
Miscellaneous.....				7	1,191,331					
Bed-sacks:										
Single.....	112,894		4,692	5,971	123,557		9,767	9,313	19,080	104,477
Double.....	54,138		1,320	1,197	56,655		4,479	9,556	14,035	42,620
Moosequito-bars:										
Single.....	68,039			266	68,305		3,186	2,016	5,202	63,103
Double.....	3,215				3,215		174	53	327	2,898
Spades.....	87,995			201	88,196		1,074	1,167	2,241	85,955
Spade-slings.....	1,500				1,500					1,500
Shovels.....	52,419			228	52,647		1,142	1,164	2,306	50,341
Knapsacks:										
Painted.....	577,350	160		570	578,080		106,235	18,258	184,493	453,387
Unpainted.....	782			273	1,055					782
Patent.....	13,406			570	13,976		85	5	90	13,886
Straps.....				1,314	1,314					1,314
Haversacks:										
Painted.....	391,228	930		1,094	393,252		47,435	24,128	71,563	311,689
Unpainted.....	7,810			588	8,398		32	174	206	8,192
Patent.....	625				625		62	17	79	546
Canteens:										
Complete.....	893,571	32		1,549	895,452		18,352	17,441	35,793	859,659
Corks.....	322,663				322,663		1,396	59	1,455	321,208

Straps	320, 474	200	320, 474	1, 400	316	1, 716	327, 954
Packs	77, 529	140	77, 529	5	5	7	7
Ax-helves	60, 794	1, 025	77, 879	1, 728	4, 520	6, 246	71, 453
Ax-sockets	31, 016	4	31, 050	194	13, 326	15, 030	40, 779
Camp-kettles	116, 739	394	117, 133	13, 463	2, 313	201	30, 819
Mess-pans	418, 493	596	419, 089	5, 614	1, 929	15, 776	101, 357
Hatchets	124, 852	5	124, 857	1, 814	1, 192	7, 743	141, 346
Hatchet-belts	134, 709	541	135, 250	950	2, 836	3, 006	131, 551
Hatchet-sockets	97, 789	140	97, 769	190	190	3, 786	131, 464
Sand-fly bars	140		140			190	97, 579
Flags:							140
Garrison	1, 088	10	1, 088	53	88	141	957
Storm	1, 529	8	1, 637	119	233	352	1, 265
Garrison and storm halliards	1, 974	8	1, 982	87	144	231	1, 751
Recruiting	1, 661	1	1, 662	27	64	91	1, 571
Recruiting halliards	3, 257	1	3, 258	11	45	3, 213	5, 834
Camp colors, infantry	5, 974	6	5, 980	132	14	146	6
Camp colors, artillery	67		67		6	6	
Camp color-cases	12		12				
Guidons	2, 354	10	2, 364	10	93	103	2, 361
Guidon-cases	142	16	158	16	5	21	137
Standards, cavalry	916		916				916
National colors, artillery	11		11				1
National colors, infantry	718	4	722	10	5	15	707
Regimental colors, artillery	208		208	2	1	3	205
Regimental colors, infantry	738	6	744	5	4	9	735
General hospital	437		437	3	12	15	422
Ambulance, or red	2, 219		2, 219			18	2, 201
Post and field hospital	981	6	987		22	18	965
Ambulance and guidon	2, 639		2, 639			22	2, 639
Hospital guidon	31		31				31
Designating, corps, &c.	49		49	1			48
Signal	14		14	7			7
Post and field	212		212				212
Miscellaneous	11		11				1
Color-cases	45		45	2	8	10	40
Color cords and tassels	132		132	5		5	132
Color belts and slings	1, 066	5	1, 071				969
Color belt-slings	1, 178		1, 178	102		102	1, 178
Stuffs, assorted	421		421				553
Flag-poles	4		4				3
Trumpets	3, 864	26	3, 890	64	211	275	3, 615
Bugles, with extra month-pieces	4, 047	21	4, 068	143	108	341	3, 727
Bugle and trumpet extra month-pieces and crooks	1, 682	13	1, 695	90	63	83	1, 612
Cords and tassels	18, 613	13	18, 626	146	350	496	18, 128
Fifes	14, 131	22	14, 153	160	164	344	13, 809
Drums:							
Complete	5, 312	6	5, 318	128	285	413	4, 905
Heads, batter	13, 591	56	13, 647	460	2, 170	2, 630	11, 017

Statement showing the quantity of clothing, camp and garrison equipage, and clothing material, in the hands of officers of the Army, &c.—Continued.

Articles.	On hand June 30, 1870.	Purchased.	Manufactured.	Taken up.	Total.	Issued to enlisted men.	Sold.	Lost, expended, and	Total.	Total remaining on hand June 30, 1871.
Drums—Continued:										
Heads, snare.....	17,689			235	17,864		495	1,849	2,344	15,520
Slings.....	11,789			51	11,840		110	277	387	11,453
Sticks, pairs.....	17,878			223	18,101		171	278½	449½	17,652
Stick-carriages.....	13,663			4	13,666		30	37	67	13,599
Cords.....	6,692			7	6,699		249	786	1,035	5,594
Snares, sets.....	11,530			18	11,548		212	457	669	10,879
Cases.....	6,332			102	6,434		124	47	171	6,263
Tents:										
Hospital.....	6,266			32	6,298		165	364	529	5,769
Hospital-flies.....	5,923			4	5,927		192	403	595	5,332
Hospital-poles, sets.....	7,372			48	7,422		135	117	252	7,170
Wall.....	8,416		2		8,418		656	706	1,362	7,055
Wall-flies.....	8,209		346	15	8,569		601	1,030	1,631	6,938
Wall-poles, sets.....	14,204			251	14,455		508	750	1,258	13,197
Common.....	29,044			184	29,228		1,921	2,776	4,697	24,531
Common poles, sets.....	32,028			744	32,772		1,033	2,393	3,446	29,326
Shelter.....	725,722			136½	725,861½		1,569	7,190	8,779	717,082½
Shelter-poles, sets.....	103,072			1,094	104,166		244	435	679	103,487
Sibley.....	129			2	131		19	30	49	82
Sibley poles.....	478		7	2	487		10	24	34	453
Sibley tripods.....	311			13	324		9	2	11	313
Miscellaneous.....	1,119				1,119		88	78	166	953
Extra wall ridge-poles.....					1,116					15
Extra wall upright poles.....										
Shelter-tent guvs.....										
Shelter-tent rings and cords.....										
Rope, feet.....	1,070			100	1,170		159		159	1,011
Tent-pins, assorted.....	260				260					260
Tent-pole staves.....	18,544				18,544					18,544
Sibley-tent poles, sets.....	1,975,686		30	13,991	1,990,707		233,515	68,319	301,834	1,687,873
Sibley-tent pipe, joints.....	2,037			11	2,048		21	81	102	1,966
Sibley-tent pipe, sets.....	2,313			164	2,477		195	140	344	2,133
Sibley-tent pipe, elbows.....	2,734				2,734		1	5	6	2,728
Iron pots.....	2,576			17	2,593		56	34	90	2,503
Pickaxes.....	55,352			57	55,409		1,088	423	1,511	53,898
Pickaxe-bayes.....	82,016			266	82,282		744	1,061	1,805	80,477

Pickaxe-edges.	1, 025	4	1, 020	1, 300	1, 360
Books:					
Clothing account, company	12, 497	79	12, 576	114	132
Descriptive, company	13, 010		13, 010	13	163
Order, company	12, 166	70	12, 245	150	184
Morning report, company	13, 722	59	13, 790	17	201
Post order	5, 908		5, 904	23	119
Post morning report	6, 483	1	6, 464	23	23
Post letter	6, 178		6, 178	45	6, 439
Post guard report	3, 774	3	3, 777	31	31
Regimental general order	2, 179		2, 217	137	153
Regimental letter	1, 998	38	2, 041	2	3, 624
Regimental descriptive	2, 638	43	2, 638	30	2, 185
Regimental index	2, 545		2, 545	33	35
Regimental order	2, 230	1	2, 231	9	2, 625
Target practice	2, 499		2, 499	9	13
Miscellaneous	1, 086	63	1, 159	4	2, 526
		10		49	2, 178
				2	2, 489
				8	10
				98	1, 071
Books—paper covers:					
Morning report, company	88		88		88
Clothing account, company	11		11		9
Order, company	14		14		14
Descriptive, company	10		10		10
Miscellaneous:					
Hats, light-colored	1, 744	2, 591	4, 335	2, 220	2, 263
Hats, straw	181		181	14	2, 148
Great-coats, irregular	35		35	2, 134	35
Fur caps	304		304		304
Snow-packs	24		24		24
Drum-cord	70		70		70
Manila rope	87, 167		87, 167		87, 167
Citizens' clothes				1	1
Silk tassel		1	1		1
Swan fountain plume		1	1		1
Vulture-feathers		4	4		4
Gilt aguilette		1	1		1
Scarlet cloth		10	104		10
Sewing-silk		1			1
Gilt epaulette		1	1		1
White duck		195	195		195
White hollands		26	26		26
Light blue flannel		50	50		50
Canvas		24	24		24
Material:					
Dark blue uniform cloth, 6-4	188, 140 7-8	75	188, 215 7-8	2 1-4	1, 441 1-24
Dark blue uniform cloth, 3-4	4, 587 11-48		4, 587 11-48	135 1-2	186, 774 5-6
Dark blue flannel, 6-4	80, 053 3-4	500	80, 053 3-4	1, 341 7-8	3, 207 5-48
Dark blue flannel, 3-4	1, 113, 692 3-4		1, 113, 692 3-4	103 1-2	80, 074 1-8
Sky blue kersey, 6-4	33, 369 23-24		33, 369 23-24	900	479 5-8
Sky blue kersey, 3-4	933, 163 7-8	101	933, 163 7-8	931 1-6	1, 112 11-12
Facing cloth, assorted	1, 615 1-4	300	1, 615 1-4	267	33, 031 11-24
				23, 034 7-24	897, 028 23-24
				565 1-4	36, 325 1-24
				24, 064 3-4	1, 619 3-8
				31 1-4	298

Statement showing the quantity of clothing, camp and garrison equipage, and clothing material, in the hands of officers of the Army, &c.—Continued.

Articles.	On hand June 30, 1870.	Purchased.	Manufactured.	Taken up.	Total.	Issued to enlisted men.	Sold.	Lost, expended, and condemned.	Total.	Total remaining on hand June 30, 1871.
Materials—Continued:										
White wool flannel	4,429				4,429		113 1-4		113 1-4	4,429
Gray shirting	1,381,163 17-24				1,381,163 17-24		362		362	1,381,050 11-94
Scarlet flannel	3,744			30	3,774		211 2-3		211 2-3	3,466
Brown drilling	933,163	34			933,197		63 1-8	3,033	3,244 2-3	928,952 1-3
Brown muslin	458,793	12 3-4			458,805 3-4		486 5-8	12 3-4	477 7-8	458,327 7-8
Bleached muslin	735 1-2				735 1-2		158 1-2	55	541 5-8	485,183 7-8
Canton flannel	366,969 5-6			1	368,970 5-6		32	51 7-8	210 3-8	368,760 11-24
Muslin delaine	52				52				52	
Black alafia	39,662	2 1-4			39,664 1-4			142 1-4	142 1-4	39,542
Silvaes padding	2,249				2,249			19	19	2,230
Silk lace, assorted				35	35					35
Worsted braid, assorted	89,276	348			89,624			288	288	89,336
Entons, assorted	794,610	7 5-12			794,617 5-12			329 82-144	259 82-144	794,357 5-12
Thread	11,605	103			11,708			33	33	11,675
Thread	1,371				1,371			14	14	1,357
Lacing-cord	7,467				7,467					7,467
Lacing-cord	1,086,157				1,086,157					1,086,157
Bunting	119				119					119
Druck cotton	572,334				572,334			98,235 1-2	98,235 1-2	474,098 1-2
Light blue cloth	23,478	5			23,483					23,493 5-6
Wadding	400	522			922			665	665	257
Hemp twine	7,833				7,833			119	119	7,714
Flax twine	2,311				2,311					2,311
Cotton twine	9,667				9,667					9,667
Barlups	1,597				1,597					1,597
Petroleum paper	3,793				3,793					3,793
Packing-boxes	83,500				83,500					83,500
Hickory straps										
Wrapping paper										
Baling rope										
Clothing tickets										
Dubbing										
Tailors' crayons										
Uniform coats, white, West Point band										

Uniform trousers, white, West Point band	13	88	13
Uniform trousers, linen, West Point band	89	88	1
Uniform jackets, red, West Point band	5		5
Uniform scarfs, West Point band	30	30	

Respectfully submitted,

QUARTERMASTER GENERAL'S OFFICE, *September 27, 1871.*

J. D. BINGHAM,
Quartermaster, United States Army.

* The increase in the quantity of clothing and equipments on hand June 30, 1870, as compared with the statement accompanying the last annual report, arises from the fact that the records have since been completed by the receipt of officers' accounts subsequent to that date.

B.—Statement showing expenditures on account of clothing, camp and garrison equipage and materials, at the principal clothing depots of Philadelphia, Jeffersonville, San Francisco, Fort Snelling, Fort Union, and New Orleans, during the fiscal year ending June 30 1871.

Philadelphia.....	\$101,837 87
Jeffersonville.....	49,557 93
San Francisco.....	40,034 22
Fort Snelling.....	1,448 72
Fort Union.....	1,800 00
New Orleans.....	6,464 32
Total expenditures.....	<u>201,143 12</u>

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, September 27, 1871.

C.—Statement of amounts received from the sale of surplus serviceable, unserviceable, damaged, and irregular articles of clothing, camp and garrison equipage and materials, sold at the principal clothing depots of Philadelphia, Jeffersonville, San Francisco, Fort Snelling, New Orleans, Fort Leavenworth, San Antonio, and Fort Union, during the fiscal year ending June 30, 1871.

Philadelphia.....	\$263,093 88
Jeffersonville.....	91,387 04
San Francisco.....	1,471 57
Fort Snelling.....	88 62
New Orleans.....	20,068 47
Fort Leavenworth.....	1,137 13
San Antonio.....	2,099 71
Fort Union.....	382 42
Total amount.....	<u>379,728 84</u>

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, September 27, 1871.

D.—Statement of claims for property purchased and seized for use of the Army received and acted upon in the clothing and equipage branch of the Quartermaster General's Office during the fiscal year ending June 30, 1871.

Number of claims received, 6; amounting to.....	\$9,165 65
Number of claims referred and recommended for settlement, 4; amounting to.....	1,532 99
Number of claims disallowed, 1; amounting to.....	4,208 00
Number of claims not finally adjusted, 2; amounting to.....	<u>3,177 00</u>

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, September 27, 1871.

E.—Statement of returns of clothing, camp and garrison equipage received, examined and transmitted to the Treasury Department, and of letters received and written, during the fiscal year ending June 30, 1871.

Number of returns of clothing and equipage on hand June 30, 1870.....	1,338
Number of returns of clothing and equipage received during the fiscal year ending June 30, 1871.....	<u>5,585</u>
Total.....	<u>6,923</u>

Number of returns of clothing and equipage examined and transmitted to the Treasury Department.....	6,805
Remaining on hand June 30, 1871	118
Number of letters received during the fiscal year.....	4,630
Number of letters written during the fiscal year.....	11,261

Respectfully submitted.

J. D. BINGHAM,

Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, *September 27, 1871.*

WAR DEPARTMENT, QUARTERMASTER GENERAL'S OFFICE,
Cemeterial Branch, Washington, D. C., September 23, 1871.

GENERAL: I have the honor to submit the following report of the operations of this branch of your office during the fiscal year ending June 30, 1871 :

There are scattered throughout the United States 74 national and 316 local, private, and post cemeteries, containing the remains of 317,850 Union soldiers, who fell during the late war. Of this number of bodies, 303,536 are interred in the national military cemeteries; the remaining 14,314 are well cared for and protected in local incorporated cemeteries. Occasionally reports reach this office that remains of Union soldiers have been discovered in obscure places and not properly buried or cared for. They are in all cases attended to at once, and the remains removed to the nearest national cemetery. During the year 2,295 remains of Union soldiers have been thus transferred to national cemeteries. It is believed that but few, if any, bodies remain uncared for.

During the past fiscal year the grounds at all the cemeteries have been kept in order, and such necessary permanent improvements made as the means at command would allow. Some of the national cemeteries are very beautiful, and will compare favorably with any of the larger city cemeteries in the United States.

Most of the ground in which these remains lie, amounting in the aggregate to more than 1,800 acres, has been purchased by the United States at a cost of about \$170,000. The work of procuring titles in fee-simple to these sites under the acts of Congress of July 28, 1866, and February 22, 1867, and joint resolution of April 13, 1866, has been continued; and at the close of the fiscal year there were on file in this office 93 deeds of conveyance to the United States of as many parcels of land in 81 different localities. A schedule appended to this report gives the names of the cemeteries and of the former owners of the land, the dates of the deeds, the number of acres in each, and the price at which the land was purchased by the United States.

The total expenditure made by the Quartermaster's Department on account of the establishment and maintenance of national military cemeteries, prior to July 1, 1870, is estimated at \$3,700,306 26. During the fiscal year ending June 30, 1871, the entire appropriation made for this purpose, \$300,000, was expended. The appropriation for the present year is \$200,000. Of this amount \$165,000 have already been expended, leaving but \$35,000 on hand, a sum considered insufficient to meet the expenses of the remainder of the year.

To complete the permanent improvements at the national cemeteries, exclusive of head-stones, it is estimated that \$450,000 will be required.

Prior to June 30, 1870, stone walls had been erected around the cem-

eteries at Chattanooga, Fort Donelson, and Pittsburgh Landing, Tennessee; Mill Springs, Camp Nelson, and Lebanon, Kentucky; New Albany, Indiana; Little Rock, Arkansas; and San Antonio, Texas; brick walls around the cemeteries at Mobile, Alabama, and Barrancas, Florida; and iron railings around the national cemeteries at Loudon Park, Baltimore, Maryland; and on two sides of the Chalmette cemetery, New Orleans, Louisiana.

During the last fiscal year stone walls have been erected or commenced at the following named cemeteries, viz: Soldiers' Home, District of Columbia; Battle, District of Columbia; Arlington, Alexandria, Ball's Bluff, Hampton, Petersburg, Richmond, Winchester, Yorktown, Virginia; Annapolis, Maryland; New Berne and Wilmington, North Carolina; and Jefferson Barracks, Missouri; a brick wall around the Cold Harbor, Virginia, cemetery; and iron railings around those at Keokuk, Iowa; Rock Island, Illinois; and on the front or road side of the Soldiers' Home cemetery, District of Columbia.

Some of these stone walls were erected without coping, it being the intention of this office to secure as many serviceable permanent inclosures as possible with the funds appropriated, and to provide coping from future appropriations; but the Hon. Secretary of War has directed that all stone walls without coping be furnished therewith at once. This is now being done.

During the fiscal year a contract was entered into with Mr. Lot Flannery, the sculptor, for the erection of a handsome arched gateway of Seneca stone, with iron gate, at the Arlington national cemetery. The work thereon is progressing but slowly, owing to the difficulty experienced by the contractor in obtaining suitable stone from the quarry.

Osage orange hedges were planted during the year inside the inclosures of nearly all the national cemeteries. One hundred and seventy-nine thousand and eighty-eight hedge-plants were set out, and nearly all are growing well. In the course of two or three years they will become one of the chief ornaments of the cemeteries. It is estimated that about 16,000 more plants will be required to complete the hedges of this kind.

At Natchez, Mississippi, a hedge of pyracanthas was planted, and at Barrancas, Florida, a trellis has been built inside the brick wall for honeysuckle and other climbing plants.

Permanent inclosures are still required to protect the following national cemeteries, viz: Alexandria, Baton Rouge, and Port Hudson, Louisiana; Andersonville and Marietta, Georgia; Beaufort and Florence, South Carolina; Salisbury and Raleigh, North Carolina; City Point, Culpeper Court-House, Danville, Fort Harrison, Fredericksburgh, Glendale, Seven Pines, and Staunton, Virginia; Grafton, West Virginia; Beverly, New Jersey; Mound City and Camp Butler, Illinois; Nashville, Murfreesborough, Knoxville, and Memphis, Tennessee; Fort Leavenworth and Fort Scott, Kansas; Jefferson City and Springfield, Missouri; Corinth, Natchez, and Vicksburgh, Mississippi; Fayetteville, Arkansas; Fort Gibson, Indian Territory, and Brownsville, Texas.

Prior to the last fiscal year permanent stone or brick lodges for the accommodation of the superintendents had been erected at the following-named cemeteries, viz: Richmond, Virginia; Salisbury, North Carolina; Beaufort and Florence, South Carolina; Marietta, Georgia; Barrancas, Florida; Natchez and Vicksburgh, Mississippi; Chalmette, Louisiana; San Antonio, Texas; Mound City and Camp Butler, Illinois; Jefferson Barracks, Missouri; Fort Leavenworth, Kansas; Fort Smith and Little Rock, Arkansas; and Keokuk, Iowa.

During the fiscal year permanent stone lodges have been erected or commenced at the cemeteries at Soldiers' Home and Battle, District of Columbia; Alexandria, City Point, Cold Harbor, Fredericksburgh, Fort Harrison, Hampton, Petersburg, Staunton, Winchester, and Yorktown, Virginia; New Berne and Wilmington, North Carolina; and brick lodges at the cemeteries at Annapolis, Maryland; Cypress Hills, New York; and New Albany, Indiana.

The total cost of these seventeen lodges when completed, will be about \$46,000.

Permanent lodges are still required at the following-named cemeteries; some of them will be erected during the present fiscal year: Alexandria, Baton Rouge, and Port Hudson, Louisiana; Andersonville, Georgia; Raleigh, North Carolina; Culpeper Court-House, Danville, Glendale, Seven Pines, Virginia, Grafton, West Virginia; Camp Nelson, Mill Springs, and Lebanon, Kentucky; Chattanooga, Knoxville, Memphis, Murfreesborough, Nashville, Fort Donelson, and Shiloh, Tennessee; Corinth, Mississippi; Fayetteville, Arkansas; Fort Gibson, Indian Territory; Fort Scott, Kansas; Jefferson City and Springfield, Missouri; and Brownsville, Texas.

Twenty thousand dollars have been expended during the year in planting 28,200 evergreen and deciduous trees and shrubs in the cemeteries, as provided by the act of Congress of July 15, 1870, making appropriations for the Army. Some have died, but nearly all are thrifty and add materially to the ornamental appearance of the cemeteries. Fourteen thousand trees and shrubs will be planted this fall to replace those that have died, and to increase the number in some of the cemeteries.

Wherever space permitted and other conditions were favorable, "sylvan halls" or "temples," of elms or maples, have been planted on the plan of a Gothic cathedral, making arched avenues for the protection of the people assembled on decoration day.

No further action than that detailed in former reports has been taken with regard to head-blocks or head-stones.

The original wooden head-boards or stakes first planted at the graves are decaying, and continually falling to the ground, requiring a considerable expenditure annually to replace them. It is desirable that some action be taken to provide permanent marks for the graves.

Prior to the last fiscal year, twenty-five volumes of the Roll of Honor had been published; during the year one volume has been added; one is now in the hands of the Public Printer, and another is in course of preparation in this office. It is thought that two more volumes will complete the work.

There are 61 cemeteries that require superintendents. Up to June 30, 1871, warrants had been issued to 113; 6 declined the appointment; the warrant of 1 was canceled; 1 did not report to the Quartermaster General; 23 have resigned or been honorably discharged; 9 have died; 1 deserted; and 15 have been dismissed by orders of the War Department; 57 remain in service, leaving 4 vacancies to be filled.

During the past fiscal year Major Oscar A. Mack, United States Army, has continued, as inspector of national cemeteries, under the provisions of the act of February 22, 1867. His reports to the Secretary of War furnished many valuable suggestions and recommendations, which have generally been carried out.

During the fiscal year ending June 30, 1871, about 2,400 letters and reports were received in this branch of the office, briefed, recorded, indexed, and filed, and 2,235 letters were written.

Accompanying this report are :

A. Statement showing permanent improvements at the various national military cemeteries.

B. Tabular record of titles to the land owned by the United States, and occupied for national cemeteries.

C. Consolidated report of the work accomplished, &c., on national cemeteries prior to and during the last fiscal year.

D. Tabular statement showing the contents of the various volumes of the Roll of Honor, (1 to 27, inclusive,) and

E. Brief sketches, in narrative form, of the various national cemeteries.

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.

Brigadier General M. C. MEIGS,
*Quartermaster General, U. S. A.,
Washington, D. C.*

A.—*Tabular statement of permanent improvements on national cemeteries.*

Running number.	Name of cemetery.	No. of interments.	Avenues and walks.	Canon monuments.	Drainage.	Cistern or well.	Records, (condition.)	Superintendent.	Officer in charge.
L—MILITARY DIVISION OF THE ATLANTIC, (Lieutenant Colonel S. Van Vliet, chief quartermaster.)									
a.— <i>Department of the East, (Colonel R. Ingalls, chief quartermaster.)</i>									
1	Cypress Hills, Long Island, N. Y.	3,632	Yes.	Yes.	Yes	Cistern	Good	John Bryson	Major R. N. Batchelder.
2	Annapolis, Md.	2,505	do	do	do	do	do	Augustus Ambrecht	Major H. C. Hodges.
3	Landon Park, Md.	1,463	do	do	do	None	do	do	Do.
4	Laurel, Md.	239	do	None	do	Well	do	John Delacroy	Captain E. B. Carling.
5	City Point, Va.	5,153	do	do	do	do	do	Vacant	Do.
6	Cold Harbor, Va.	1,951	do	None	do	do	do	Charles W. Hoyme	Major H. C. Hodges.
7	Culpeper Court-House, Va.	1,349	do	do	do	do	do	Morris Keim	Captain E. B. Carling.
8	Danville, Va.	1,312	do	do	do	do	do	William Wright	Do.
9	Fort Harrison, Va.	814	do	do	do	do	do	Charles Fitchett	Do.
10	Fredricksburgh, Va.	15,244	do	Yes	do	do	do	Amos J. Potter	Do.
11	Hampton, Va.	1,189	do	None	do	do	do	James Browning	Do.
12	Glendale, Va.	5,129	do	Yes	do	do	do	August Miller	Do.
13	Poplar Grove, Petersburg, Va.	6,187	do	do	do	do	do	Patrick Hart	Do.
14	Richmond, Va.	6,483	do	do	do	do	do	Vacant	Do.
15	Seven Pines, Va.	1,358	do	None	do	do	do	George Griffin	Do.
16	Stanton, Va.	748	do	do	do	do	do	P. Sedgewick	Major H. C. Hodges.
17	Winchester, Va.	4,433	do	Yes	do	do	do	Hugh Carey	Captain E. B. Carling.
18	Yorktown, Va.	2,180	do	do	do	do	do	James Murphy	Major H. C. Hodges.
19	Grafton, W. Va.	1,233	do	do	do	Cistern	do	None	Do.
20	Beverly, N. J.	1,147	do	None	None	do	do	George A. Dichtl	Captain E. B. Carling.
21	Raleigh, N. C.	1,160	do	Yes	do	Tank	do	Alexander Jello	Do.
22	New Bern, N. C.	3,250	do	Yes	do	Cistern	do	George W. Harbison	Do.
23	Salisbury, N. C.	12,112	do	None	do	Well	do	Matthew Dellingham	Do.
24	Wilmington, N. C.	2,060	do	Yes	do	Tank	do		
b.— <i>Department of the Lakes, (Major J. J. Dana, chief quartermaster.)</i>									
25	New Albany, Ind.	2,807	Yes	None	Yes	Well	Good	Thomas E. Halleck	Captain C. H. Hoyt.
26	Crown Hill, Indianapolis, Ind.	708	do	Yes	do	None	do	None	

A.—Tabular statement of permanent improvements on national cemeteries—Continued.

Running number.	Name of cemetery.	No. of interments.	Avenues and walks.	Cannon monuments.	Drainage.	Cistern or well.	Records, (condition.)	Superintendent.	Officer in charge.
II.—DEPOT OF WASHINGTON, (Capt. Wm. Myers, depot quartermaster.)									
37	Arlington, Va.	15,585	Yes	Yes	Yes	Cistern	Good	E. H. Harner	Captain William Myers.
38	Alexandria, Va.	3,635	do	do	do	Fount.	do	Frederick Kaufman	Do.
39	Ball's Bluff, Va.	34	do	None	do	do	do	None	Do.
30	United States Military Asylum, D. C.	5,488	do	do	Yes	Cistern	do	William Tyler	Do.
31	Battle, D. C.	40	do	do	None	None	do	Andrew Macartney	Do.
III.—MILITARY DIVISION OF THE SOUTH, (Lieutenant Colonel J. C. McFerran, chief quartermaster.)									
a.—Department of the South, (Major A. R. Eddy, chief quartermaster.)									
32	Florence, S. C.	2,823	Yes	Yes	Yes	Well	Good	P. P. R. M. Sattes	Captain G. W. Bradley.
33	Beaufort, S. C.	9,072	do	do	do	do	do	Niels Christensen	Do.
34	Mobile, Ala.	1,844	do	None	do	do	do	None	Lieut. S. E. Clark.
35	Barrancas, Fla.	1,383	do	Yes	do	Cistern	do	John Trindle	Lieut. Ira MacNitt
36	Lebanon, Ky.	865	do	None	do	Well	do	Charles Goble	Lieut. J. A. Sheetz.
37	Logan's Cross Roads, Ky.	708	do	Yes	do	do	do	James Burke	Do.
38	Camp Nelson, Ky.	3,638	do	do	do	do	do	Ewald Schneider	Do.
39	Cave Hill, Louisville, Ky.	3,904	do	do	do	do	do	do	Do.
40	Lexington, Ky.	3,948	do	do	do	do	do	do	Do.
41	Knoxville, Tenn.	3,135	do	None	do	do	do	Thomas Ridge	Lieut. C. A. Dempsey.
42	Chattanooga, Tenn.	12,877	do	do	do	do	do	Frederick Buntley	Do.
43	Nashville, Tenn.	16,494	do	Yes	do	do	do	Francis O'Donohoe	Lieut. W. V. Richards.
44	Fort Donelson, Stone River, Tenn.	6,139	do	do	do	do	do	L. S. Doolittle	Do.
45	Memphis, Tenn.	670	do	None	do	do	do	John Fitzgerald	Do.
46	Pittsburgh Landing, Tenn.	13,965	do	Yes	do	Tank	do	John F. Carl	Lieut. E. R. Gibbs.
47	Abernethy, Ga.	3,586	do	do	do	Well	do	Enos P. Trussell	Lieut. James Miller.
48	Marietta, Ga.	13,714	do	None	do	do	do	John Maloney	Lieut. J. H. Baldwin.
49	Corinth, Miss.	10,083	do	Yes	do	Cistern	do	James G. Hughes	Do.
50	Naches, Miss.	5,092	do	do	do	Well	do	Vacant	Lieut. James Miller.
51	Do.	3,061	do	do	do	Cistern	do	Charles N. Ruby	Lieut. I. O. Shelby.
52	Vicksburg, Miss.	16,585	do	do	do	do	do	Alexander Henry	Do.

b.—*Department of Texas*, (Lieutenant Colonel James A. Ekin, chief quartermaster.)

53 Chalmette, New Orleans, La.....
 54 Alexandria, La.....
 55 Baton Rouge, La.....
 56 Fort Hudson, La.....
 57 Fort St. Philip, La.....
 58 San Antonio, Texas.....
 59 Brownsville, Texas.....

IV.—*MILITARY DIVISION OF THE MISSOURI*, (Colonel D. H. Rucker, chief quartermaster.)

a. *Department of the Missouri*, (Lieutenant Colonel L. C. Easton, chief quartermaster.)

60 Jefferson Barracks, Mo.....
 61 Jefferson City, Mo.....
 62 Springfield, Mo.....
 63 Camp Butler, Ill.....
 64 Mound City, Ill.....
 65 Rock Island, Ill.....
 66 Fort Leavenworth, Kans.....
 67 Fort Scott, Kans.....
 68 Little Rock, Ark.....
 69 Fort Smith, Ark.....
 70 Fayetteville, Ark.....
 71 Fort Gibson, Ind. Ter.....

b.—*Department of the Platte*, (Major A. J. Perry, chief quartermaster.)

72 Keokuk, Iowa.....
 73 Gettysburgh, Pa.....
 74 Andictam, Md.....

12,367	Yes	Yes	Yes	Cistern	Good	P. P. Carroll	Major James Belger.
1,281	do	do	do	do	do	Gerald Fitzgerald	Do.
2,940	do	do	do	do	do	Vacant	Lieut. John G. Loefer.
3,894	do	do	do	do	do	George B. Craft	Do.
337	do	do	do	Well	do	None	Major James Belger.
288	do	do	do	do	do	do	Captain H. C. Card.
2,727	do	Yes	do	None	do	John J. Smith	Lieut. Gregory Barrett, Jr.
10,228	Yes	Yes	Yes	Cistern	Good	Martin Burke	Captain George H. Weeks.
653	do	do	do	do	do	G. L. Emil Sherer	Do.
1,544	do	do	do	Well	do	Conrad Schmidt	Do.
1,367	do	do	do	Cistern	do	James McCanley	Do.
5,141	do	do	do	Well	do	Joseph Barrigan	Do.
140	do	do	do	None	do	None	Do.
1,093	do	do	do	Cistern	do	Hugh M. Fogg	Major J. M. Moore.
407	None	do	do	do	do	Absalom Hyde	Do.
5,431	Yes	Yes	Yes	Cistern	do	Wesley Markwood	Lieut. S. W. Groesbeck.
1,791	do	do	do	do	do	David Allen	Lieut. F. W. Thibaut.
1,224	do	do	do	Well	do	Henry Smith	Lieut. John Carland.
2,117	do	do	do	do	do	William Thomas	Do.
627	Yes	Yes	Yes	Nnoe	Good	Clayton Hart	Major A. J. Perry.
3,564	Yes	None	Yes	Cistern	Good	None	None.
4,695	do	do	do	do	do	do	Do.

* Since dead.

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army

QUARTERMASTER GENERAL'S OFFICE, CRIMETRIAL BRANCH, Washington, D. C., September 23, 1871.

B.—Tabular record of titles to land occupied and owned by the United States for national cemeteries.

Running number.	Name of cemetery.	Name of prior owner.	Date of deed to United States.	Number of acres.	Price paid.	Remarks.
1	Alexandria, Va.	City of Alexandria.	June 1, 1862	2 acres	\$1 00	Donated.
2	Alexandria, Va.	John H. Baggett and wife	Nov. 8, 1863	25 07 1.16'	1,000 00	Purchased.
3	Alexandria, Va.	John H. Baggett and wife	Nov. 24, 1870	95 07 8.12'	25 38	Do.
4	Alton, Ill.	Thomas Dunford and wife	Oct. 15, 1867	0.44 acre	100 00	Do.
5	Alton, Ill.	Robert E. Lee	Sept. 25, 1868	1,100 acres	26,800 00	Purchased at tax sale.
6	Barrancas, Florida	United States	Oct. 16, 1868	7 acres	3,600 00	Military reservation.
7	Battle Rouge, La.	Pierre Baron and Simoula Barono	July 30, 1868	1.633 acre	2,600 00	Purchased.
8	Baton Rouge, La.	James Mulloy	April 4, 1869	3,600 square feet	1 00	Do.
9	Baxter Springs, Kans.	City of Baxter Springs, W. M. Matheny, mayor.	Feb. 10, 1863	31 acres	75 00	Purchased at tax sale.
10	Beaufort, S. C.	State of South Carolina	Aug. 24, 1864	1 acre	1 00	Donated.
11	Beverly, N. J.	Prospect Hill Ass'n, N. E. Williston and others	Aug. 28, 1869	1,500 square feet	100 00	Purchased.
12	Brattleborough, Vt.	George Randall and wife.	Aug. 30, 1864	1 acre	150 00	Do.
13	Bristol, Pa.	Polly Miller, executrix of George Miller	Sept. 6, 1865	6.62 acre	450 00	Do.
14	Camp Butler, Springfield, Ill.	Cave Hill Cemetery Company, Isaac Everett, president.	July 23, 1863	42,114 square feet	10,528 50	Do.
15	Cave Hill, Louisville, Ky.	Ward Payne and wife	Nov. 26, 1867	9,646 square feet	1,325 00	Do.
16	Cave Hill, Louisville, Ky.	City of New Orleans	May 26, 1868	13.60 acres	13,600 00	Donated.
17	Chalmette, New Orleans, La.	Joseph Ruohs and others.	Feb. 29, 1868	75.45 acres	15,080 00	Purchased.
18	Chattanooga, Tenn.	Chester Rural Cemetery Association, Joshua P. Eyre, president.	Feb. 14, 1868	1,000 square feet	10 00	Do.
19	Chester, Pa.	E. Comer	Jan. 23, 1868	8.19 acres	1,512 00	Purchased.
20	City Point, Va.	Ezekiel S. Tally, guardian for Indiana H. Slaughter.	April 21, 1869	1.34 acre	200 00	Do.
21	Cold Harbor, Va.	Walker, White, and Vance	Feb. 1, 1868	30 acres	3,500 00	Do.
22	Corinth, Miss.	Crown Hill Cemetery Association, I. M. Ray, president.	Aug. 27, 1866	Section 10.	5,000 00	Do.
23	Crown Hill, Indianapolis, Ind.	E. B. Hill and wife.	May 10, 1867	6 acres	1,400 00	Do.
24	Calpeper Court-House, Va.	Cypress Hills Cemetery Associat'n, Ed. Driggs, president.	Mar. 29, 1870	2 acres.	9,600 00	Do.
25	Cypress Hills, Long Island, N. Y.	Town of Danville, Ky.	July 10, 1867	2 lots	600 00	Do.
26	Danville, Ky.	Oakdale Cemetery Company, B. B. Woodward, president.	June 26, 1866	3.25 acres	1 00	Do.
27	Davenport, Iowa.	Stephen L. Stone and wife	May 30, 1867	1.47 acre	100 00	Not yet completed.
28	Fayetteville, Ark.	David Walker	May 30, 1867	2 acres	474 00	Purchased.
29	Fayetteville, Ark.	United States	April 23, 1867	15.34 acres	100 00	Military reservation.
30	Fin'a Point, N. J.	James P. Flood and Nathan Braddon.	Mar. 26, 1869	0.492 acre	100 00	Purchased.
31	Fort Donelson, Dover, Ky.	Alpheus W. Childrey	Oct. 16, 1868	5.11 acres	1 00	Do.
32	Fort Harrison, Va.	United States.				Military reservation
33	Fort Leavenworth, Kans.	Fort Scott Town Company, John A. Crawford, president.				Do.
34	Fort Scott, Kan.	United States.				Do.
35	Fort Smith, Ark.	D. H. Gordon and wife.	Nov. 5, 1868	6 acres.	3,001 25	Military reservation.
36	Fredericksburgh, Va.			12,005 acres		Purchased.

37	Frankfort, Ky	Frankfort Cemetery Company	Jan. 4, 1863	9 lots	1,000 00	Do.
38	Glendale, Va	Lacy C. Nelson and others	June 16, 1869	1.84 acre	200 00	Do.
39	Town of Montpelier, C. W. Willard, and others,	Terre Haute and Indiana Railroad Company,	Mar. 26, 1866	Lot No. 324	1 00	Donated.
40	Greenmount, Indianapolis, Ind	W. R. McKune, president.	June 15, 1870	63 lots	1 00	Do.
41	Hampton, Va	William E. Wood	July 19, 1867	60 3/4 29'	5,000 00	Purchased by appraisement.
42	Hampton, Va	George Whipple and wife	Oct. 21, 1868	4.75 acres	1,306 00	Purchased.
43	Jefferson Barracks, Mo	United States	Dec. 7, 1867	2 acres	800 00	Military reservation.
44	Jefferson City, Mo	Israel B. Read and wife	Aug. 28, 1866	1 lot	1 00	Purchased.
45	Keokuk, Iowa	W. Patterson, mayor, &c	Aug. 5, 1870	Lots	490 00	Donated.
46	Keokuk, Iowa	Hiram Barney and wife	Aug. 30, 1870	Lots	600 00	Purchased.
47	Keokuk, Iowa	John Bertell and wife	June 10, 1867	10 acres	5,000 00	Do.
48	Knoxville, Tenn	John Dameron	June 1, 1867	56 lots	1,125 00	Do.
49	Lebanon, Philadelphia, Pa	J. C. White	June 6, 1867	20 1/2 22'	50 00	Do.
50	Lexington, Ky	James J. McElroy	April 1, 1867	16,111 square feet	3,222 00	Do.
51	Lexington, Ky	Lexington Cemetery Association, M. C. Johnson, trustee.	July 1, 1867	12.12 acres	1,818 00	Do.
52	Little Rock, Ark	City of Little Rock, John Wassal, mayor	April 9, 1868	4.75 acres	3.05 acres	Donated.
53	Logan's Cross Roads, Ky	William H. Logan and wife	July 5, 1867	Section 29	1 00	Do.
54	Madison, Wis	C. W. Keys, mayor, &c	June 18, 1866	24.56 acres	1 00	Do.
55	Marietta, Ga	H. G. Cole and wife	Sept. 23, 1867	8 acres	1,000 00	Purchased.
56	Memphis, Tenn	William Stiles and others	Feb. 20, 1867	16 acres	3,200 00	Do.
57	Memphis, Tenn	A. Alston	April 8, 1867	19.91 acres	5,017 56	Do.
58	Memphis, Tenn	Coleman Boyd	May 23, 1868	2 lots	Do.	Donated.
59	Mobile, Ala	City of Mobile, Geo. A. Ketchum, acting mayor	May 31, 1866	3 lots	40 25	Do.
60	Montgomery, Ala	City of Montgomery, L. W. Coleman, mayor	July 14, 1866	10 acres	750 00	Purchased.
61	Mound City, Ill	City of Racine, G. A. Thomson, mayor	May 22, 1868	45 91'	6,926 45	Do.
62	Mound City, Ill	S. Staats Taylor and Edwin Parson, trustees	May 4, 1867	11.07 acres	1,900 00	Do.
63	Nashville, Tenn	M. B. Howell, master in chancery	July 3, 1866	7.589 acres	570 17 1/2	Do.
64	Natchez, Miss	Margaret Case and others	Jan. 31, 1867	5.46 acres	955 50	Do.
65	New Bern, N. C	William P. Moore and wife	Mar. 13, 1869	18,340 square feet	1,834 00	Do.
66	New Albany, Ind	Charles and Georgiana Bowman	Dec. 15, 1862	67.680 square feet	6,768 00	Do.
67	Oakwood, Chicago, Ill	Oakwood Cemetery Association, J. Y. Seamon, president.	April 25, 1866	Part of lot No. 24	300 00	Do.
68	Oakwood, Chicago, Ill	Oakwood Cemetery Association, J. Y. Seamon, president.	May 1, 1867	1,890 square feet	2 50	Do.
69	Oak Hill, Evansville, Ind	City of Evansville	July 30, 1869			Do.
70	Odd Fellows', Philadelphia, Pa	Odd Fellows' Cemetery Association, H. L. Hopkins, president.	April 27, 1868			Do.
71	Pea Patch Island, Del	United States	June 30, 1868	5.75 acres	1,100 00	Military reservation.
72	Point Lookout, Md	Logan A. Smith and wife	April 3, 1868	8.13 acres	1,500 00	Purchased.
73	Poplar Grove, Petersburg, Va	John Flowers	April 3, 1868	8.00 acres	3,000 00	Do.
74	Port Hudson, La	James H. Gibbons and wife	Aug. 17, 1869	1 lot	1 00	Do.
75	Prarie du Chien, Wis	James S. Lockwood	June 18, 1866	3 acres	900 00	Donated.
76	Richmond, Va	William Slater and wife	July 20, 1867	5 acres	1,500 00	Purchased.
77	Richmond, Va	Wm. L. Williams, trustee, and Ann B. Brown, president.	July 10, 1868			Do.
78	Rose Hill, Columbia, Tenn	Rose Hill Cemetery Corporation, John Baird, president.	May 1, 1866			Do.
79	Salisbury, N. C	Joseph Horah and wife	Jan. 7, 1870	50 3/4 29'	600 00	Purchased.
80	San Antonio, Texas	W. C. A. Thielepape, mayor	Aug. 19, 1867	1.69 acre	134 33	Do.
81	Seven Pines, Va	Richard Hilliard	April 24, 1867	1.3 acres	500 00	Purchased.
82	Shiloh, Pittsburgh Landing, Tenn	Heirs of T. H. E. Stubbs	Nov. 23, 1868	10.05 acres		Do.

B.—*Tabular record of titles to land, &c.*—Continued.

Running number.	Name of cemetery.	Name of prior owner.	Date of deed to United States.	Number of acres.	Price paid.	Remarks.
82	Soldiers' Home, D. C.	United States	Aug. 16, 1867	5 acres	\$218 75	Military reservation.
83	Springfield, Mo.	R. B. Owen, mayor	Jan. 10, 1867	23,560 square feet	00 01	Purchased.
84	Spring Grove, Cincinnati, Ohio	State of Ohio	Sept. 30, 1863	1,463 acre	900 00	Purchased.
85	Stanton, Va.	Nicholas K. Trout and others	July 10, 1863	79 69*	594 50	Do.
86	Stone's River, Murfreesboro', Tenn	James M. Tompkins for Benjamin Lillard	Aug. 10, 1868	89 105*	692 50	Do.
87	Stone's River, Murfreesboro', Tenn	James M. Tompkins for Benjamin Lillard	Aug. 27, 1868	40 acres	9 000 00	Do.
88	Wicksburgh, Miss.	A. H. Javins and wife	Feb. 29, 1867	5 acres	2 000 00	Do.
89	Wilmington, N. C.	Lease D. Ryttenberg	Mar. 23, 1863	2 lots	150 00	Do.
90	Woodland, Cleveland, Ohio	C. E. Hills, city clerk	Sept. 23, 1863	2 721 acre	490 00	Do.
91	Yorktown, Va.	Frederick H. Powers	Mar. 10, 1868		*5,000 00	Do.
92	Brownsville, Texas					
93						

* Gold.

Respectfully submitted,

J. D. BINGHAM,
Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, CRIMINAL BRANCH, Washington, D. C., September 23, 1871.

C.—Consolidated report of work accomplished on national cemeteries prior to and during the year ending June 30, 1871.

Running number.	Name of cemetery.	INCLOSURES BUILT.			LOGS Erected.	Linear ft. Oaage orange hedges planted.	Number of trees set out.	Number of shrubs set out.	Number of flag-staffs erected.	Expenditures.	Remarks.
		Stone wall.	Brick wall.	Iron rail.								Stone or brick, 1 or 1½ story.
I.—MILITARY DIVISION OF THE ATLANTIC.											
a.—Department of the East.											
1	Cypress Hills, Long Island, N. Y.				Brick, 1½ story	2,430	25	259		\$11,312 55	
2	Annapolis, Md.	1,739			Brick, 1 story	1,562	386	50		3,367 19	
3	Beverly, N. J.					2,700	30	5		838 65	
4	Calverton Court House, Va.				Stone, 1½ story	2,469	200	212		916 21	
5	City Point, Va.				do	2,220	205	183		663 63	
6	Cold Harbor, Va.		971½		do	1,040	157	84		575 72	
7	Danville, Va.				Stone, 1½ story	1,310	361	96		694 58	
8	Fredericksburgh, Va.				do	2,901	215	140		1,651 94	
9	Fort Harrison, Va.				do	1,765	319	18		619 19	
10	Glendale, Va.				Stone, 1½ story	1,130	188	203		712 43	
11	Hampton, Va.	2,907			Stone, 1½ story	3,010	102	309		654 74	
12	Poplar Grove, Petersburg, Va.	2,676			Stone, 1 story	2,605	291	187		710 21	
13	Richmond, Va.	2,357			Brick*	2,323	401	1,500		1,465 66	* Prior to fiscal year.
14	Staunton, Va.				Stone, 1½ story	840	206	32	1	1,089 96	
15	Seven Pines, Va.				do	876	165	40		272 12	
16	Winchester, Va.	1,917			Stone, 1 story	1,914	345	26		3,352 54	
17	Yorktown, Va.	1,357			do	1,338	195	129		253 98	
18	Grafton, W. Va.			2,140			175	106		148 53	
19	London Park, Baltimore, Md.	2,450			Stone, 1½ story	2,450	284	392		289 23	* Prior to fiscal year.
20	New Bern, N. C.				Brick*	1,800	175	169		872 71	
21	Raleigh, N. C.				Stone, 1½ story	1,138	202	100		507 37	
22	Salisbury, N. C.	2,319			do	2,100	245	33		1,349 33	
23	Wilmington, N. C.				do	2,100	40	5		1,490 71	* Prior to fiscal year
	Cemeteries other than national									979 85	
	Total Department of the East.	17,722	971½	2,140	15 { 4 brick } 11 stone }	37,311	4,882	4,297	1	34,178 01	
b.—Department of the Lakes.											
24	New Albany, Ind.	2,160			Brick, 1 story	4,000	681	6,210		4,016 58	
	Cemeteries other than national									40 00	
	Total Department of the Lakes.	2,160			Brick, 1 story	4,000	681	6,210		4,056 58	
	Total Military Division of the Atlantic.	19,882	971½	2,140	16 { 5 brick } 11 stone }	41,311	5,563	10,507	1	38,224 59	

C.—Consolidated report of work accomplished on national cemeteries, &c.—Continued.

Running number.	Name of cemetery.	INCLOSURES BUILT.		LODGES ERECTED.		Linear ft. Osage orange hedges planted.	Number of trees set out.	Number of shrubs set out.	Number of flag-stalls erected.	Expenditures.	Remarks.
		Stone wall.	Brick wall.	Iron rail-fence.	Stone or brick, 1 or 1½ story.						
	II.—DEPOT OF WASHINGTON.	Feet.	Feet.	Feet.							
25	Arlington, Va.	12,589			Stone 1½ story.	4,299	1,204	1,071		\$35,206 44	Arlington mansion occupied as lodge.
26	Alexandria, Va.	1,975					128	50		10,149 50	
27	Ball's Bluff, Va.	1,854								10,890 00	
28	Soldiers' Home, D. C.	1,203†		734	Stone 1 story.	3,675	141	45		7,322 69	
29	Battle, D. C.	1,803†			do.	1,910	44	26		4,241 97	
	Total Depot of Washington.....	16,882		734	3 stone.	9,884	1,517	1,192		57,742 63	
	III.—MILITARY DIVISION OF THE SOUTH.										
	a.—Department of the South.										
30	Florence, S. C.				Brick*	1,358	300	1,200		772 43	
31	Beaufort, S. C.				Brick*	4,505	2,072	100		2,583 85	
32	Mobile, Ala.		*2,550			(†)	215	300		5,187 42	
33	Barranca, Fla.		*1,216		Brick*					789 56	† Trellis with honeysuckle and climbing plants.
34	Lebanon, Ky.	*1,367								150 00	
35	Mill Springs, Ky.	*1,066								224 00	
36	Camp Nelson, Ky.	*2,497								177 00	
37	Knoxville, Tenn.						10	50		533 86	
38	Chattanooga, Tenn.	*9,440				2,373	67	50		12,126 43	
39	Nashville, Tenn.					6,200	780	600		2,663 00	
40	Memphis, Tenn.					6,067	575			3,310 74	
41	Fort Donelson, Tenn.	*4,816				3,850	260			1,732 57	
42	Memphis, Tenn.					3,600	270	40		2,071 15	
43	Pittsburgh Landing, Tenn.	*2,818				5,333	1,188	300		1,744 90	
44	Andersonville, Ga.					3,172	985			4,345 46	
45	Marbleta, Ga.				Brick*	5,959	350			1,091 82	
46	Corinth, Miss.					4,580	344	45		2,453 85	
47	Natchez, Miss.				Brick*	3,776	100	100		6,401 53	† Pyracanthus hedge.
48	Vicksburg, Miss.				Brick*	2,647†	1,270	150		32,120 81	
	Total Department of the South.....	22,204	3,766		6 brick.....	54,020	12,495	2,935		80,970 34	

b.—Department of Texas.

49 Chalmette, New Orleans, La.
 50 Baton Rouge, La.
 51 Alexandria, La.
 52 Port Hudson, La.
 53 San Antonio, Tex.
 54 Brownsville, Tex.

Total Department of Texas.

Total Military Division of South.

IV.—MILITARY DIVISION OF THE MISSOURI.

a.—Department of the Missouri.

55 Jefferson Barracks, Mo.
 56 Jefferson City, Mo.
 57 Springfield, Mo.
 58 Camp Butler, Ill.
 59 Mound City, Ill.
 60 Quincy, Ill.
 61 Alton, Ill.
 62 Fort Leavenworth, Kans.
 63 Fort Scott, Kans.
 64 Little Rock, Ark.
 65 Fort Smith, Ark.
 66 Fayetteville, Ark.
 67 Fort Gibson, Ind. Ter.
 68 Rock Island, Ill.

Total Department of the Missouri.

b.—Department of the Platte.

69 Keokuk, Iowa.

Total Department of the Platte.

Total Military Division of Missouri.

V.—MILITARY DIVISION OF THE PACIFIC.

No national cemeteries.

* Prior to fiscal year.

The annual report has not been received from officer in charge of Department of Texas up to this date. The figures in the within columns have been approximated from the records on file in this office.

49	Chalmette, New Orleans, La.	500	Brick*	5,000	158	41	1,489 07	\$4,346 00
50	Baton Rouge, La.			2,650	549	83	1,887 50	1,887 50
51	Alexandria, La.			2,340	415	123	1,617 55	1,617 55
52	Port Hudson, La.						547 00	547 00
53	San Antonio, Tex.		Stone*					2,002 89
54	Brownsville, Tex.							
	Total Department of Texas.	500	2 { 1 brick 1 stone }	9,990	1,720	246	1	10,931 11
	Total Military Division of South.	500	8 { 7 brick 1 stone }	64,010	14,216	3,181	1	91,901 49
IV.—MILITARY DIVISION OF THE MISSOURI.								
a.—Department of the Missouri.								
55	Jefferson Barracks, Mo.	1,200	Brick*		1,500	500		7,969 47
56	Jefferson City, Mo.				150	50		954 12
57	Springfield, Mo.				375	125		2,862 15
58	Camp Butler, Ill.		Brick*		450	150		3,386 68
59	Mound City, Ill.		Brick*		750	250		3,404 09
60	Quincy, Ill.							1,266 25
61	Alton, Ill.							10 50
62	Fort Leavenworth, Kans.		Brick*		375	8,583		849 88
63	Fort Scott, Kans.							664 84
64	Little Rock, Ark.		Brick*		66			796 49
65	Fort Smith, Ark.	2,929	Stone*		200	264		1,285 00
66	Fayetteville, Ark.			1,887	61	132		1,599 40
67	Fort Gibson, Ind. Ter.			2,300	150	122		1,700 23
68	Rock Island, Ill.	500						824 00
	Total Department of the Missouri.	4,129	6 { 5 brick 1 stone }	4,187	4,077	19,166		27,774 09
b.—Department of the Platte.								
69	Keokuk, Iowa.	1,508	Brick*					8,040 91
	Total Department of the Platte.	1,508	1 brick					8,040 91
	Total Military Division of Missouri.	2,008	7 { 6 brick 1 stone }	4,187	4,077	19,166		35,815 00
V.—MILITARY DIVISION OF THE PACIFIC.								
	No national cemeteries.							

C.—Consolidated report of work accomplished on national cemeteries, &c.—Continued.

Running number.	Name of cemetery.	INCLOSURES BUILT.			LODGES ERECTED.		Linear ft. Orange hedges planted.	Number of trees set out.	Number of shrubs set out.	Number of flag-staffs erected.	Expenditures.	Remarks
		Stone wall.	Brick wall.	Iron rail-ings.	Stone or brick, 1 or 1½ story.							
	RECAPITULATION.	<i>Feet.</i>	<i>Feet.</i>	<i>Feet.</i>								
	Military Division of the Atlantic.....	19,882	971½	2,140	16 { 5 brick } 11 stone }	41,311	5,563	10,507	1	\$38,324 59		
	Depot of Washington.....	16,882	734	734	3 stone.....	9,884	1,517	1,192		57,742 63		
	Military Division of the South.....	22,328	3,766	500	8 { 7 brick } 1 stone }	64,010	14,216	3,181	1	91,901 49		
	Military Division of the Missouri.....	4,129		2,008	7 { 6 brick } 1 stone }	4,187	4,077	19,166		35,815 00		
	Military Division of the Pacific.....											
	Expended for other purposes.....										76,306 29	
	Total in the United States.....	64,221	4,737½	5,381½	34 { 18 brick } 16 stone }	119,392	23,373	34,046	2	300,000 00		

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.

QUARTERMASTER GENERAL'S OFFICE, CEMETERY BRANCH, Washington, D. C., September 23, 1871.

D.—Schedule of Rolls of Honor published by the Quartermaster General.

No. of volume.	No. of general order.	Date of general order, Quartermaster General's Office.	Places of interments.	No. of pages.	No. of names contained in volume.
1	35	June 15, 1865	Washington, D. C.	197	11,007
2	58	Oct. 6, 1865	Wilderness and Spottsylvania Court-House, Va.	20	722
3	69	Nov. 25, 1865	Andersonville, Ga.	225	12,293
4	10	Jan. 27, 1866	Alexandria, Va.	69	3,601
5	31	May 1, 1866	Fortress Monroe and Hampton, Va.	56	2,655
6	32	May 1, 1866	Sundry districts in Texas	35	1,440
7	58	July 20, 1866	Maine, Maryland, Minnesota, Pennsylvania, Rhode Island, &c.	138	7,450
8	71	Sept. 5, 1866	Arkansas, California, Indiana, Michigan, Maryland, &c.	196	6,870
9	82	Oct. 8, 1866	New Hampshire, Massachusetts, Connecticut, &c.	244	15,567
10	93	Dec. 3, 1866	Wisconsin, New York, Pennsylvania, Iowa, Maryland, &c.	212	12,008
11	96	Dec. 11, 1866	Chattanooga, Knoxville, and Murfreesborough, Tenn.	443	17,443
12	15	Mar. 8, 1867	New York, New Jersey, Pennsylvania, Iowa, Maryland, Virginia, Illinois, Missouri, Arkansas, Texas, and Utah Territory.	173	9,542
13	52	Aug. 27, 1867	Cypress Hills, New York, &c.	135	7,452
14	7	Feb. 20, 1868	Union prisoners throughout the South.	337	11,015
15	9	Feb. 26, 1868	Antietam, Maryland, and Virginia.	367	18,300
16	19	June 8, 1868	Gettysburgh, Pennsylvania, Department of the East, &c.	392	20,441
17	20	June 9, 1868	Cemeteries in Kentucky.	516	14,555
18	94	June 19, 1868	Fort Harrison, Virginia, &c.	469	22,900
19	36	Sept. 11, 1868	Baltimore, Md., Petersburg, Va., New Berne, N. C., Florence, S. C., Baton Rouge, La., &c.	408	17,443
20	13	Mar. 3, 1869	Corinth, Miss., Shiloh, Tenn., and Jefferson Barracks, Mo.	324	19,417
21	94	June 19, 1869	Memphis, Tenn., and Chalmette, La.	349	23,016
22	.....	Aug. 4, 1869	Nashville, Tenn.	524	16,485
23	.....	Aug. 5, 1869	Marietta, Ga., Chattanooga, Stone River, and Knoxville, Tenn. (additional).	323	16,675
24	.....	Aug. 9, 1869	Vicksburgh, Miss. and New Albany, Ind.	224	12,375
25	.....	Mar. 5, 1870	Fredericksburgh, Hampton, Va., Mobile, Ala., Barrancas, Fla., Alexandria, La., and Fort Gibson, Indian Territory.	336	25,766
26	.....	Dec. 5, 1870	Mound City, Ill., Cemeteries in Ohio, Kansas, Arkansas, and Virginia, (additional).	250	13,411
27	.....	June 8, 1871	Beaufort, S. C., Natchez and Vicksburg, Miss., and Pittsburgh Landing, Tenn., (additional).	.....	11,487
Total.....				.....	357,666

Schedules of final disposition of bodies published by the Quartermaster General.

No. of volume.	No. of general order.	Date of general order, Quartermaster General's Office.	No. of pages.	No. of bodies.
1	8	February 24, 1868	30	47,368
2	21	June 11, 1868	60	57,155
3	33	August 13, 1868	40	35,577
4	19	March 2, 1869	41	63,847
Total.....			171	203,947

Respectfully submitted.

J. D. BINGHAM,
Quartermaster, United States Army.QUARTERMASTER GENERAL'S OFFICE, CEMETERY BRANCH,
Washington, D. C., September 23, 1871.

E.—*Brief sketches of national cemeteries.*

I.—MILITARY DIVISION OF THE ATLANTIC.

a.—DEPARTMENT OF THE EAST

1. *Cypress Hills Cemetery, Long Island, N. Y.*—At the beginning of the fiscal year 3,631 bodies reposed in this cemetery. During the year 1 has been delivered to friends, and 2 received and interred, making the number in this cemetery on June 30, 1871, 3,632. The national cemetery plat (which is situated within the limits of the incorporated Cypress Hills cemetery) has been purchased, and arrangements are now in progress for the erection of a suitable brick lodge for the superintendent. Most of the trees and shrubs, furnished by authority of the Quartermaster General, have been planted, and are, as is also the cemetery, well kept by the superintendent.

2. *Annapolis Cemetery.*—Situated one-fourth of a mile from the city of Annapolis, Maryland; area $3\frac{1}{4}$ acres. A stone wall to inclose the cemetery has been contracted for, cost \$5,850; a substantial brick lodge has been erected for the use of the superintendent. There are 2,505 bodies interred; 2,351 known, 154 unknown. Flag-staff in center of grounds.

3. *Culpeper Court-House Cemetery.*—Situated in the suburbs of Culpeper Court-House, Virginia; area 6 acres. A stone wall to inclose the cemetery has been contracted for, to replace the wooden fence, cost \$6,747 47. Proposals have been invited for building a one-and-a-half story stone lodge. Six bodies of unknown Union soldiers, found on the plantation of I. S. Hamilton, Fauquier County, Virginia, were removed to the cemetery in December, 1870. There are 1,349 bodies interred, 448 known and 901 unknown. Flag-staff in the center of the grounds.

4. *City Point Cemetery.*—Situated one and a half miles from City Point, Virginia; area $6\frac{1}{2}$ acres. A contract will soon be made to inclose the cemetery with a stone wall, to replace the wooden fence, cost \$7,059 60. A superintendent's lodge of stone has been contracted for, to replace the frame building, cost \$2,466 66; 5,155 interments; 3,755 known, 1,400 unknown. A flag-staff in the center of the grounds.

5. *Beverly Cemetery.*—Situated one and a half miles from the town of Beverly, New Jersey; area 1 acre. A stone wall has been contracted for, cost \$2,240. No superintendent's lodge at this cemetery, nor is it considered necessary to build one, the number of interments being only 147, and names unknown. No flag-staff on the premises.

6. *Cold Harbor Cemetery.*—Situated on the battle-field of Cold Harbor, Virginia, eleven and a half miles from Richmond; area $1\frac{1}{4}$ acres. A contract has been made for a brick wall to inclose the cemetery, cost \$3,328. A superintendent's lodge of stone has been contracted for, cost \$2,466 66; 854 graves and 2 trenches, containing 1,951 bodies; 681 known, 1,270 unknown. A flag-staff in center of grounds.

7. *Danville Cemetery.*—Situated within the limits and south of the town of Danville, Virginia. Area, $3\frac{41\frac{1}{2}}{1000}$ acres; surrounded by a wooden fence in good condition. Superintendent occupies a frame building. No stone or brick improvements have been ordered; 1,292 graves, containing 1,312 bodies; 1,169 known, 143 unknown. A flag-staff in the center of the grounds. The title has not yet been transferred to the United States, but is in litigation.

8. *Fredericksburgh Cemetery.*—Situated on Willis's Hill, (Marye's Heights), Spottsylvania County, Virginia; area, $11\frac{1}{2}$ acres. A superintendent's stone lodge has been contracted for, cost \$2,466 66. Proposals have been invited to build a stone or brick wall. Five bodies of known

Union soldiers have been removed from various points in the State of Virginia, and interred here during the year; 6,606 graves, containing 15,243 bodies; 2,399 known, 12,844 unknown. A flag-staff in the center of the grounds.

9. *Fort Harrison Cemetery*.—Situated on the west side of the Varina road, Varina Township, Henrico County, Virginia, eight miles southeast of Richmond, and three miles from "Dutch Gap." Area, $1\frac{1}{10}$ acres. Stone lodge has been contracted for, cost \$2,500; also a stone wall to surround the grounds, cost \$2,581 87; 525 graves, containing 814 bodies. A flag-staff in the center of the grounds.

10. *Glendale Cemetery*.—Situated in Varina Township, Henrico County, Virginia, fifteen miles east of Richmond, and two miles north of Malvern Hill battle-field. Its area is $2\frac{1}{2}$ acres. No stone or brick improvements have as yet been ordered for this cemetery, which is inclosed with a wooden picket fence. The superintendent occupies a frame lodge. A flag-staff, flying the national ensign, is in the center of the grounds. There are 636 graves, containing 1,189 remains of Union soldiers; 236 known and 953 unknown.

11. *Grafton Cemetery*.—Situated one-quarter of a mile west of Grafton, West Virginia. Its area is $2\frac{1}{2}$ acres. It is surrounded by a good picket fence, and provided with flag-staff, and a frame lodge for the superintendent. No stone or brick improvements have as yet been ordered. The title has not been vested in the United States, but is in litigation, the land being owned by certain minors whose guardian has no authority to sell it.

12. *Hampton Cemetery*.—Situated one-half mile from Hampton, Virginia, near the "Seminary;" area, $11\frac{1}{2}$ acres. A stone lodge has been contracted for at a cost of \$2,980. A contract has also been made to inclose it with a rubble-stone wall at a cost of \$9,785. A flag-staff is provided. During the year the remains of 4 Union soldiers, inmates of the National Military Asylum at Hampton, were received and interred here. There are 5,125 graves, containing the remains of 5,129 deceased Union soldiers; 4,660 known, and 469 unknown.

In the middle of this cemetery, through the exertions of Miss D. L. Dix, whose tender care for the soldier has not ceased with his death, a granite obelisk, 75 feet high, has been erected, at a cost to the contributing citizens of about \$10,000. It bears appropriate inscriptions and devices, and contains, with the foundation, about 750 tons of New England granite.

13. *Laurel Cemetery*.—Situated near the city of Baltimore, Maryland. The soldiers' graves are in one section of this private cemetery, incorporated by the colored inhabitants of the city of Baltimore. There is no superintendent, and no lodge has been erected. Trees and shrubbery for the ornamentation of the graves have been planted this year. The United States own the graves of 229 colored Union soldiers, all known.

14. *Loudon Park Cemetery*.—Situated on the Frederick road, three miles from Baltimore, Maryland. The United States occupy three acres within this incorporated cemetery. The grounds are inclosed with an iron railing on the three sides, and it is contemplated to build a rubble-stone wall on the fourth (the east) side. A flag-staff has been provided; trees and shrubs have been planted during the year. No regular superintendent is now employed. Two bodies of Union soldiers interred during the year; 1,969 graves, containing 1,969 bodies, three-fourths of which are known.

15. *New Berne Cemetery*.—Situated one mile north of New Berne, North Carolina; area, $7\frac{1}{2}$ acres. A superintendent's lodge of stone has been

contracted for; cost \$3,340. Contract made to build a stone wall; cost, \$8,575. A flag-staff in the center of the grounds; 3,244 bodies interred; 2,176 known, 1,068 unknown.

16. *Poplar Grove Cemetery*.—Situated in Dinwiddie County, Virginia, five miles south of Petersburg; area, 8 acres. A superintendent's lodge has been contracted for; cost, \$2,700. Contract made to build a stone wall; cost, \$9,028 25. Flag-staff provided; 5,361 graves, containing 6,186 bodies; 2,050 known, 4,136 unknown.

17. *Raleigh Cemetery*.—Situated one mile east of Raleigh, North Carolina; area, 6 acres, surrounded by a good board fence; has a frame lodge and a flag-staff. No brick or stone improvements ordered; 1,160 bodies interred; 609 known, 551 unknown.

18. *Richmond Cemetery*.—Situated in Henrico County, Virginia, three and one-half miles from Richmond, Virginia; area, 8 acres; has a brick lodge and a flag-staff in the center of the grounds. Contract made to build a stone wall around the grounds; cost, \$8,182 05; 4,721 graves, containing 6,434 bodies; 812 known, 5,622 unknown; 109 bodies of unknown Union soldiers, received from various places in Virginia, interred during the year.

19. *Staunton Cemetery*.—Situated one and one-fourth miles from Staunton, Virginia; area, $1\frac{1}{4}$ acres, surrounded by a fine picket fence. A flag-staff provided. Contract to build a stone lodge has been let; cost, \$2,550; 639 graves, containing 748 bodies; 230 known, 518 unknown.

20. *Seven Pines Cemetery*.—Situated nine miles east of Richmond, Virginia; area, $1\frac{3}{10}$ acres, inclosed by a good picket fence. Frame lodge for superintendent. Flag-staff in center of the grounds. No brick or stone improvements ordered; 790 graves, containing 1,357 bodies; 141 known, 1,216 unknown.

21. *Salisbury Cemetery*.—Situated one-half mile south of Salisbury, North Carolina; area, 6 acres; frame lodge; flag-staff in center of the grounds. No brick or stone improvements ordered; 12,112 bodies interred, most of which are known.

22. *Winchester Cemetery*.—Situated one-fourth mile from Winchester, Virginia; area, 5 acres. A stone lodge has been built; cost, \$2,550. Contract made to build a stone wall; cost, \$6,220 50. Flag-staff in the center of the grounds; 4,264 graves, containing 4,440 bodies; 2,101 known, 2,339 unknown.

23. *Wilmington Cemetery*.—Situated one mile east of Wilmington, North Carolina; area, 5 acres. A superintendent's lodge has been contracted for; cost, \$3,300. A contract made to build a stone wall; cost, \$7,725. A flag-staff in center of grounds; 2,057 bodies interred; 2,053 known, 4 unknown.

24. *Yorktown Cemetery*.—Situated one-half mile from Yorktown, Virginia; area $2\frac{1}{2}$ acres. A superintendent's lodge contracted for, cost \$2,595. Contract for stone wall made, cost \$4,348. Flag-staff provided; 1,596 graves, containing 2,180 bodies, 745 known, 1,435 unknown.

(b.) DEPARTMENT OF THE LAKES.

25. *New Albany Cemetery*.—Situated in the suburbs of New Albany, Indiana; area 8 acres, inclosed by a stone wall built in 1868. A substantial brick lodge has been erected for the use of the superintendent, at a cost of \$2,670. The grounds are tastefully adorned with evergreen and shrubbery, mostly furnished through the liberality of the patriotic citizens of New Albany; 2,807 bodies are interred here, 2,130 known, 677 unknown.

26. *Crown Hill Cemetery*.—The soldiers' cemetery forms part of the Crown Hill cemetery, which is situated three miles north of the city of Indianapolis, Indiana, on the Michigan road. It contains one acre of land originally owned by the Crown Hill Cemetery Association, and bought for the sum of \$5,000. The ground is high and rolling, and the situation one of great beauty.

The bodies now resting in this national cemetery were originally interred in the Greenlawn Cemetery in that city, and were removed to the Crown Hill Cemetery between October, 1866, and March, 1867.

The grounds are laid out with walks and avenues. A flag-staff is provided. The grounds are inclosed by the general iron fence which surrounds the whole cemetery; 708 bodies interred here, all of which are identified. The graves are not marked by head-boards, but are numbered, and are fully identified by means of the records on file in the office of the superintendent of the Crown Hill Cemetery.

II. DEPOT OF WASHINGTON.

27. *Arlington Cemetery*.—Situated in Fairfax County, Virginia, about three miles from Washington, District of Columbia; area, 200 acres, inclosed by a stone wall; cost \$34,619 75. A beautiful gateway is in course of construction on the east side of the cemetery, cost \$6,500. The mansion, formerly owned by the rebel General R. E. Lee, is used as the office of the superintendent. The trees and shrubs, furnished by the Quartermaster General, have been planted, and are, as is also the cemetery, well cared for by the superintendent; 15,589 bodies interred here, 11,240 known, 4,349 unknown; 357 bodies of rebel prisoners of war are also interred here.

28. *Alexandria Cemetery*.—Situated in the southwestern suburbs of the city of Alexandria, Virginia, inclosed by a stone wall; cost \$6,201 49. A stone lodge for the use of the superintendent has been erected, cost \$3,325 22; 3,635 bodies interred; 3,533 known, 102 unknown.

29. *Ball's Bluff Cemetery*.—Situated on the Potomac River, opposite Edwards's Ferry, where the battle was fought. Inclosed by a stone wall and Osage orange hedge, cost \$820. No lodge has been erected, nor is it thought necessary, no superintendent being required here; 54 bodies interred; 1 known, 53 unknown.

30. *United States Military Asylum Cemetery*.—Situated about two miles northeast of Washington, District of Columbia, upon a portion of the grounds of the asylum, whence it derives its name. Area about 6 acres, inclosed by a stone wall, 1,265½ feet long, costing \$3,227 45, and an iron railing, facing the road, 733½ feet, costing \$1,870 42. A stone lodge has been built for the use of the superintendent, cost \$1,690; 5,488 bodies interred; 5,210 known, 278 unknown.

31. *Battle Cemetery*.—Situated on the Seventh street road, a little more than 4 miles from the city of Washington, on the place where a sharp engagement took place on the 12th of July, 1864, whence the cemetery derives its name. Area, 1 acre; inclosed by a stone wall, cost \$2,525 73. A stone lodge has been built for the use of the superintendent, cost \$1,690; 40 bodies interred, all known, arranged in a circle around the flag-staff erected in the center of the grounds.

III.—MILITARY DIVISION OF THE SOUTH.

(a.) DEPARTMENT OF THE SOUTH.

32. *Florence Cemetery*.—Situated about one mile southeast of the town of Florence, South Carolina; area, 4 acres, inclosed by a picket fence. A brick lodge was built in 1869 for the use of the superintendent; 1,358 feet of Osage orange hedge have been planted inside the fence; 25 bodies have been removed to the cemetery from the vicinity. The cemetery now contains 2,823 bodies; 31 known, 2,792 unknown.

33. *Beaufort Cemetery*.—Situated about three-quarters of a mile from the town of Beaufort, South Carolina, and half a mile from Beaufort River; area, 31 acres, inclosed by a neat picket fence. A brick lodge for the use of the superintendent was erected in 1869. The cemetery is laid out in the form of a half-circle, with the flag-staff in the center; 4,525 feet of Osage orange hedge have been planted around the cemetery, inside the fence; 9,072 bodies interred; 5,465 known, 3,607 unknown.

34. *Mobile Cemetery*.—Situated in the Magnolia Cemetery, at the southwest end of the city of Mobile, Alabama, occupying the corner between Ann and Virginia streets. The United States possess two lots, one containing 2.11 acres, for white soldiers, and one containing 1.60 acres, for colored soldiers; inclosed by a brick wall 1,224 feet long. The cemetery has been thoroughly drained by brick gutters constructed inside and outside the wall. This work not being completed until the latter part of December, 1870, it was too late to commence digging the ditch for the hedge; it will be planted this fall. A flag-staff has been erected. The climate being very malarious, the Secretary of War has ordered that no superintendent be appointed to the cemetery, all the superintendents assigned to this place having died; 844 bodies interred; 679 known, 165 unknown.

35. *Barrancas Cemetery*.—Situated on the military reservation near Fort Barrancas, Florida; area, 4½ acres, inclosed by a brick wall. It was found impracticable to plant a hedge around this cemetery on account of a brick walk, 12 feet wide, running inside the wall; a trellis of wire for climbing plants is being constructed inside the walk, to take the place of the hedge. A brick lodge has been erected for the use of the superintendent, and a flag-staff in the center of the grounds; 1,383 bodies interred; 1,000 known and 383 unknown.

36. *Lebanon Cemetery*.—Situated two and a half miles from Lebanon, Kentucky, to the south of the Lebanon and Columbia pike; area, about 2 acres, inclosed by a dry stone wall. A wooden lodge erected for the superintendent; flag-staff in the center of the grounds; 865 bodies interred; 601 known, 264 unknown.

37. *Logan's Cross-roads Cemetery*.—Situated at Logan's Cross-roads, Pulaski County, Kentucky, on the north side of the Somerset, Columbia and Jamestown road, about 500 yards from the first position taken in line by the Union forces at the battle of Mill Springs. Area, 3½ acres; donated by Mr. William H. Logan, who owns the farm on which the battle was fought. The cemetery is inclosed by a substantial stone wall. A frame lodge for the superintendent, and a flag-staff, have been erected; 708 bodies interred; 340 known, 368 unknown.

38. *Camp Nelson Cemetery*.—Situated near the center of the old Camp Nelson, Jessamine County, Kentucky, for a long time occupied as a rendezvous for the organization of colored troops; area, about 6½ acres;

inclosed by a stone wall. A wooden lodge has been built for the use of the superintendent. The flag-staff, originally erected near the grave of General Nelson, at Camp Dick Robinson, but which was cut down by disloyal persons, has been taken to this cemetery and erected on the summit of the hill; 3,638 bodies interred; 2,459 known, 1,179 unknown.

39. *Cave Hill Cemetery*.—Situated in the Cave Hill Cemetery, Louisville, Kentucky, containing 42,114 square feet; inclosed by a picket fence. The graves are all neatly sodded, and the borders of the sections and vacant spaces between the graves are handsomely adorned with shrubbery and roses furnished by the ladies of Louisville. This cemetery being inside an incorporated cemetery, no superintendent is appointed at this place; 3,904 bodies interred; 3,341 known, 563 unknown.

40. *Lexington Cemetery*.—The lot occupied as a burial-place for Union soldiers forms a part of the Lexington City Cemetery, Fayette County, Kentucky, one of the most beautiful rural cemeteries in Kentucky. It contains 16,111 square feet. The graves are arranged in concentric circles, with a central plat bearing a flag-staff. The lot is inclosed by a picket fence, and, being inside an incorporated cemetery, no superintendent has been appointed, but the lot is under the care of the superintendent of the city cemetery; 948 bodies interred; 838 known, 110 unknown.

41. *Knoxville Cemetery*.—Situated about three-quarters of a mile west of the city of Knoxville, Knox County, Tennessee, and contains 10 acres. It is laid out in concentric circles, with walks and avenues radiating from the center, where a flag-staff has been erected from which floats a national flag presented by the ladies of Knoxville. It is inclosed by a substantial panel fence, which is to be replaced by a permanent inclosure. An Osage orange hedge has been planted inside the fence. A lodge of masonry will be erected to replace the frame building now occupied by the superintendent. Two interments have been made during the last fiscal year, and the cemetery now contains 3,155 bodies, of which 2,080 are known and 1,075 unknown.

42. *Chattanooga Cemetery*.—Situated one and one-fourth miles southeast of the city of Chattanooga, Tennessee, and within eighty feet of the Western and Atlantic Railroad. It contains 75.45 acres of ground, which is high, rolling, and very picturesque, and which is inclosed by a stone wall 4 feet high. The ground is laid off in irregular oval formed sections, separated by walks and avenues. A drive, 24 feet wide, runs around the whole cemetery. A flag-staff has been erected in the center. Four interments have been made during the last year, and the cemetery now contains 12,877 bodies, of which 7,950 are known and 4,927 unknown.

43. *Nashville Cemetery*.—Situated six miles northwest from the city of Nashville, Davidson County, Tennessee, (the Louisville and Nashville Railroad running through it;) contains nearly 46 acres of ground. A natural rivulet running through the grounds has been widened, deepened, and neatly walled up to form an outlet for the drainage. The cemetery has been inclosed by a stone wall, cost \$13,001 65, inside of which 6,667 feet of Osage orange hedge have been planted. A one and a half story stone lodge for the use of the superintendent has been erected, cost \$2,765. During the last year 6 interments have been made, and the cemetery now contains 16,494 bodies, of which 12,492 are known, 4,002 unknown.

44. *Murfreesborough Cemetery*.—Situated about three miles from Murfreesborough, Tennessee, directly in the center of the battle-field of Stone River; area, about sixteen acres, inclosed by a stone wall, inside of

which is planted an Osage orange hedge, 3,850 feet long. A substantial stone lodge has been erected for the use of the superintendent; 18 interments have been made during the last year, and the cemetery now contains 6,139 bodies, of which 3,832 are known, and 2,307 unknown.

45. *Fort Donelson Cemetery*.—Situated about one thousand feet back of the west bank of the Cumberland River, and about half a mile below the town of Dover, Stewart County, Tennessee, on the site of the United States Fort Donelson, and about half a mile above the rebel fort of that name; inclosed by a stone wall, inside of which 3,600 feet of Osage orange hedge have been planted. A wooden lodge has been built for the use of the superintendent; 670 bodies interred; 158 known, 512 unknown.

46. *Memphis Cemetery*.—Situated six miles from the city of Memphis, Tennessee, on the Memphis and Ohio Railroad, at its intersection with the Memphis and Raleigh Plank Road; area, 43.91 acres, inclosed by a wooden picket fence, inside of which 5,333 feet of Osage orange hedge have been planted. The grounds are neatly laid out with graveled walks and drives. Trees and shrubs have been extensively planted. A comfortable lodge for the accommodation of the superintendent stands near the main gate, and a fine flag-staff has been erected at a conspicuous point near the entrance; 13,965 bodies have been interred, of which 5,149 are known, and 8,816 unknown.

47. *Pittsburgh Landing Cemetery*.—Situated immediately on the west bank of the Tennessee River, at Pittsburgh Landing, Hardin County, Tennessee, three and a quarter miles northeast of Shiloh Church; area, 10.05 acres; inclosed by a rough stone wall of the most substantial character. A convenient lodge has been built for the superintendent and a flagstaff erected on the bluff overlooking the river. The grounds are laid off into sections and groups by avenues and walks, neatly graded and graveled. Three interments have been made during the past year, and the cemetery now contains 3,586 bodies, of which 1,230 are known, 2,356 unknown.

48. *Andersonville Cemetery*.—Situated at Andersonville, Sumter County, Georgia, sixty miles south of Macon, Georgia, on the South-western Railroad; area, about 75 acres. The bodies interred in this cemetery are buried in trenches, about three hundred yards from the stockade, or prison pens. The grounds are inclosed by a picket fence, and a wooden lodge has been erected for the accommodation of the superintendent; 13,714 bodies interred; 12,812 known, 902 unknown.

49. *Marietta Cemetery*.—Situated in the outskirts of the village of Marietta, Georgia, in full view of the Kennesaw Mountains, twenty miles from Atlanta, on the line of the Western and Atlantic Railroad; area, 24.56 acres, donated to the United States by Mr. Henry G. Cole, of Marietta. The ground rises gradually from all sides and on the summit near the center of the cemetery a flagstaff has been erected. The cemetery is inclosed by a stone wall, inside of which 4,580 feet of Osage orange hedge have been planted. A substantial brick lodge for the use of the superintendent has been erected; 24 interments have been made during the past year. The cemetery now contains 10,093 bodies, of which 7,058 are known, 3,035 unknown.

50. *Corinth Cemetery*.—Situated about three-fourths of a mile southeast from the railroad depot at Corinth, Mississippi, and near the crossing of the Memphis and Charleston and the Mobile and Ohio Railroads; area, twenty acres, inclosed by a brick wall, inside of which 3,756 feet of Osage orange hedge have been planted. The cemetery is laid off in sections, intersected by well-graveled walks and avenues. It is located

on a commanding eminence, and a flag-staff has been erected on the summit of the hill. A brick lodge for the use of the superintendent has been constructed near the main entrance; 5,682 interments, 1,789 known, 3,884 unknown.

51. *Natchez Cemetery*.—Situated on the east side of the river-road, about one and a half miles north of the landing at Natchez, Mississippi, half a mile north of the United States Marine Hospital, and two hundred yards northwest of the city cemetery; area, 11.07 acres, inclosed by a substantial brick wall, inside of which 2,647 feet of pyracanthas hedge have been planted. About fourteen hundred trees and shrubs have been planted throughout the cemetery, and a sylvan hall for the protection of visitors on Decoration day, as contemplated by the Quartermaster General, has been set out. A wooden lodge has been erected for the accommodation of the superintendent; 3,081 bodies interred; 504 known, 2,577 unknown.

52. *Vicksburgh Cemetery*.—Situated at Vicksburgh, Mississippi, a short distance above the city, covering the ground upon which stood the rebel batteries that offered most effective resistance to the passage of our gunboats. The entire hillside toward the river has been converted into terraces. Area 40 acres, purchased at a cost of \$9,000. The cemetery is still under construction, under the charge of Mr. James Gall, jr., civil engineer, and will, according to his estimate, be completed by the 31st of October, 1871. The cemetery is inclosed by a picket fence; a brick lodge for the use of the superintendent has been erected; 64 interments have been made during the past year, and the cemetery now contains 16,585 bodies, of which 4,839 are known, 11,746 unknown.

(b.) DEPARTMENT OF TEXAS.

53. *Chalmette Cemetery*.—Situated at Chalmette, Louisiana, in the parish of St. Bernard, six miles below the city of New Orleans, one mile below the United States Jackson Barracks, and fronting on the Mississippi River; area 13.60 acres, donated by the city of New Orleans to the United States. It is in the form of a rectangle, long and narrow, inclosed by iron fences in the front and rear, and wooden palings on the long sides. The grounds are laid out in squares, intersected by drives and walks, which are mainly shelled, and present a creditable appearance; 7,500 Osage orange plants have been set out inside the fence, and many trees and shrubs planted throughout the cemetery. A flag-staff is erected in the center of the grounds. A brick lodge has been erected for the use of the superintendent. Eleven interments have been made during the past year, and the cemetery now contains 12,267 bodies; of which 6,783 are known, 5,484 unknown.

54. *Alexandria Cemetery*.—Situated at Pineville, Louisiana, on the north side of the Red River, opposite to and about one mile from the city of Alexandria, Louisiana; area 8 acres; inclosed by a substantial picket fence, with an archway at the main entrance. A frame building for the use of the superintendent has been erected; 1,281 bodies interred; 518 known, 363 unknown.

55. *Baton Rouge Cemetery*.—Situated at the eastern extremity of the city of Baton Rouge, Louisiana, about one and a quarter miles distant from the garrison grounds. It is immediately adjoining the city cemetery. Area 7 acres, inclosed by a wooden paling fence. A wooden lodge for the superintendent has been erected, and a flag-staff in the center of the grounds. Seven interments made during the past year. The cemetery now contains 2,940 bodies; 2,447 known, 493 unknown.

56. *Port Hudson Cemetery*.—Situated in the parish of East Baton Rouge, Louisiana, one and a half miles southeast of the city of Port Hudson, and one mile from Port Hickey, a steamboat landing on the Mississippi River; area 8 acres, inclosed by a picket fence. A frame building for the superintendent has been erected, and a flag-staff in the center of the grounds; 3,804 interments; 523 known, 3,281 unknown.

57. *Fort St. Philip Cemetery*.—Situated on the left bank of the Mississippi River, sixty miles below the city of New Orleans, Louisiana; area about two acres of land, and located on a Government military reservation; inclosed by a good picket fence. No superintendent being deemed necessary at this cemetery, no lodge has been erected. A flag-staff in the center of grounds; 327 interments; 57 known, 270 unknown.

58. *San Antonio Cemetery*.—Situated on what is called Powder-house Hill, about one mile east of the city of San Antonio, Texas, and three miles west of the Salado River; area 1.89 acres, inclosed with a substantial stone wall. A stone lodge for the use of the superintendent and a flag-staff in center of grounds have been erected; 282 bodies interred; 241 known, 41 unknown. Stone-blocks at the heads of the graves.

59. *Brownsville Cemetery*.—Situated on an island formed by a lagoon, 100 yards from the Rio Grande River and 200 yards southeast of the Government barracks at Fort Brown, Texas. The grounds are inclosed by the lagoon, which forms a moat all around them. A wooden lodge for the use of the superintendent and a flag-staff in center of the grounds have been erected; 2,727 interments; 1,526 known, 1,201 unknown.

IV.—MILITARY DIVISION OF THE MISSOURI.

(a.) DEPARTMENT OF THE MISSOURI.

60. *Jefferson Barracks Cemetery*.—Situated on the Jefferson Barracks reservation, ten miles south of St. Louis, Missouri, seven hundred and four feet west of the Mississippi River; area 20.25 acres, inclosed by a stone wall with iron gates. A wooden building for the use of the superintendent has been erected, and a flag-staff in center of grounds. The cemetery is laid out in sections, intersected by avenues and walks; 10,228 bodies interred; 8,341 known, 1,887 unknown.

61. *Jefferson City Cemetery*.—Situated on part of the east side of outlot No. 39, in Jefferson City, Missouri, two thousand four hundred feet south of the Missouri River; area 2 acres, inclosed by a wooden picket fence. Porches have been built during the past year on the superintendent's lodge; 653 interments; 340 known, 313 unknown. The cemetery is in excellent order, reflecting credit on the superintendent.

62. *Springfield Cemetery*.—Situated on the Kickapoo Prairie, three miles southeast of the city of Springfield, Greene County, Missouri; area, five acres. The cemetery is not inclosed by fence, but an Osage orange hedge has been planted around it, and it is contemplated to inclose the grounds by a stone or brick wall or iron railing. A wooden lodge for the superintendent, and a flag-staff in center of the grounds, have been erected; 29 interments have been made during the past year, and the cemetery now contains 1,544 bodies; 861 known, 683 unknown.

63. *Mound City Cemetery*.—Situated on the north bank of the Ohio River, about six miles east of the city of Cairo, Illinois, and one and a half miles from Mound City, Illinois; area, ten acres; inclosed by a wooden picket fence. An Osage orange hedge has been planted around the grounds, and is doing well. A brick lodge for the superintendent has been erected; flag-staff in center of grounds; 5,141 interments; 2,804 known, 2,337 unknown.

64. *Camp Butler Cemetery*.—Situated in Sangamon County, Illinois, six miles east of the city of Springfield; area, 6.02 acres; inclosed by a wooden picket fence, inside of which an Osage orange hedge has been planted. A brick lodge for the superintendent has been erected. The cemetery is divided into two parts by a picket fence—one containing Union soldiers, the other rebel prisoners of war; 724 bodies of Union soldiers interred, 559 known, 165 unknown, and 643 rebel prisoners of war. The cemetery is reported in good order.

65. *Rock Island Cemetery*.—Situated on the military reservation on Rock Island, in the Missouri River; area, three-fifths of an acre; inclosed by an iron fence. No lodge has been erected, there being no superintendent appointed. An Osage orange hedge will be planted inside the fence; 140 interments; 133 known, 7 unknown. In a separate inclosure, containing $1\frac{1}{2}$ acres of land, and inclosed with a four-bar fence, 1,556 rebel prisoners of war are interred.

66. *Fort Leavenworth Cemetery*.—Situated on the military reservation at Fort Leavenworth, Kansas, half a mile southeast of the garrison, three miles northwest of the city of Leavenworth, and one mile from the Missouri River. This cemetery was originally established as the burial-place of the garrison at Fort Leavenworth. It has since been enlarged to accommodate all the Union dead originally interred in a number of localities in the State and in the contiguous counties in Missouri; area, 5.11 acres; inclosed by a wooden-picket fence. A brick lodge for the use of the superintendent, and a flag-staff in the center of the grounds, have been erected. An Osage orange hedge and a number of trees and shrubs have been planted, most of which are growing well; 1,093 interments; 417 known, 676 unknown.

67. *Fort Scott Cemetery*.—Situated in Bourbon County, Kansas, one and a half miles southeast of the military post of Fort Scott; area, five acres; donated by the Fort Scott Town Company to the United States; inclosed by a wooden picket-fence. Quarters for the use of the superintendent are hired in the neighborhood. Trees and shrubs have been purchased for this cemetery, and will be set out at the earliest practicable date; 407 interments; 306 known, 101 unknown.

68. *Little Rock Cemetery*.—Situated in Pulaski County, Arkansas, one and a half miles southeast of the city of Little Rock; area $12\frac{1}{2}$ acres, inclosed by a stone wall. A brick lodge for the use of the superintendent and a flag-staff have been erected. Three interments have been made during the past year, and the cemetery now contains 5,431 bodies; 3,159 known, 2,272 unknown. Sixty-six trees have been planted throughout the grounds and are doing well. The cemetery is in first-class order.

69. *Fort Smith Cemetery*.—Situated on the Government reservation about one-quarter of a mile from Fort Smith, Sebastian County, Arkansas, and very near the bank of the Arkansas River; area, six acres, inclosed by a substantial picket fence. A stone lodge for the superintendent has been erected and a flag-staff in center of grounds. Three hundred and thirty-five feet of picket fence have been erected around the superintendent's lodge. The cemetery is well drained, and laid out in sections, intersected by walks and avenues. Four hundred and sixty-four trees and shrubs have been set out during the last year, and two thousand head-stakes to replace decayed head-boards; 1,791 interments; 548 known, 1,243 unknown.

70. *Fayetteville Cemetery*.—Situated on the summit of a small hill about half a mile southeast of the town of Fayetteville, Washington County, Arkansas; area, 4.71 acres, inclosed by a wooden fence. A

wooden lodge for the superintendent and a flag-staff in the center of the grounds have been erected. The lot inclosed is of a square form, within which is inscribed a circle, and within the circle a six-pointed star. The graves were arranged by States, in sections, each point of the star constituting a section, and also spaces between the points and within the circle, making thus twelve sections. One thousand eight hundred and eighty-seven feet of Osage orange hedge have been planted inside the fence, and 193 trees and shrubs throughout the grounds; 1,224 interments; 465 known, 759 unknown.

71. *Fort Gibson Cemetery*.—Situated on the military reservation at Fort Gibson, Indian Territory. This cemetery was first established as a burial place of the garrison at Fort Gibson, but is now the resting place of all the Union dead originally interred in the neighborhood: inclosed by a board fence, inside of which 2,300 feet of Osage orange hedge have been planted, as well as 272 trees and shrubs throughout the grounds. A one story frame lodge has been erected for the superintendent; 2,117 interments; 149 known, 1,968 unknown.

72. *Keokuk Cemetery*.—Situated in Lee County, Iowa, near the city of Keokuk, and part of the city cemetery, of which one lot was donated by the city to the United States, to which have been added contiguous lots bought at the price of \$1,090. The cemetery is inclosed by an iron railing 1,508 feet long. A one and a half story brick lodge has been erected for the use of the superintendent. Trees and shrubs will be planted as soon as the necessary grading of the grounds shall have been completed; 627 interments; 600 known, 27 unknown.*

73. *Antietam Cemetery*.—Situated on the battle-field at Antietam, near Sharpsburgh, Maryland; area, 10 acres. The grounds were bought by the State of Maryland at a price of \$100 per acre. The cemetery is in charge of the Antietam Cemetery Association, composed of delegates from the several States having soldiers interred in the cemetery. The cemetery contains 4,667 bodies; 1,475 were interred by the association from the battle-field; the rest of the bodies (3,192) were removed from places in the vicinity by the Quartermaster's Department, and interred at the cost of the United States. All the embellishments and permanent improvements—the stone wall, superintendent's lodge, &c.—were defrayed by the cemetery association, who also contemplate the erection of a handsome monument of Rhode Island granite. The grounds were publicly opened and dedicated on September 17, 1867. The total number of interments is 4,667, of which number 1,406 cannot be identified.

74. *Gettysburgh Cemetery*.—Situated on the battle-field of Gettysburgh, Pennsylvania, on the west side of Baltimore turnpike; area, 17 acres. The grounds are beautifully located, and command an extensive view of the surrounding country, which is highly picturesque. They are laid out in lots for each State proportionate in size to the number of known graves belonging to each. They are inclosed by a stone wall, with a gateway of ornamental iron work. A stone lodge for the accommodation of the superintendent has been built. An imposing monument, the corner-stone of which was laid with appropriate ceremonies on the 4th of July, 1865, has been erected. The cemetery is under the charge of a corporation, being controlled by the board of managers of the Soldiers' National Cemetery at Gettysburgh, consisting of one commissioner from each State represented in the cemetery; 3,564 interments; 2,585 known, 979 unknown.

* Not yet under charge of the United States.

Report of Major M. I. Ludington, Quartermaster, U. S. A., of the operations of the branch of the Quartermaster General's Office pertaining to regular supplies, transportation, and barracks and quarters during the fiscal year ending June 30, 1871.

WAR DEPARTMENT,
QUARTERMASTER GENERAL'S OFFICE,
Washington, D. C., September 25, 1871.

GENERAL: In compliance with your circular letter of June 9, 1871, I have the honor to report that during the fiscal year ending June 30, 1871, I was on duty in the office of the Quartermaster General of the Army.

On August 25, 1870, I was placed in charge of the supply and claim branch of this office in addition to the other duties being performed by me at the close of the previous fiscal year and mentioned in my last annual report. (For statement of public funds in my possession during the fiscal year, see paper herewith marked A.)

I respectfully submit the following report of the operations of the several branches under my charge during the fiscal year ending June 30, 1871:

INDEBTED RAILROAD COMPANIES.

At the close of the last fiscal year ending June 30, 1870, there was due the United States from these railroad companies for railway material and rolling stock, purchased under the provisions of Executive orders of August 8 and October 14, 1865, and for repairs to railroads, \$4,646,522 68. During the fiscal year ending June 30, 1871, interest has accrued upon this indebtedness, and expenses have been incurred in the prosecution of suits, to the amount of \$274,323 71. Payments have been made to the amount of \$196,495 86, leaving due on the 1st of July, 1871, \$4,724,350 53, \$77,827 85 more than on the 1st of July, 1870.

Accompanying this report is a statement, marked B, showing the original amount of the indebtedness of the companies; the total interest and expenses to 30th June, 1871; the interest and expenses for the year, the payments made during the year, and the total payments, with the balance unpaid on the 30th of June, 1871.

The statement also shows what companies have reduced their debts, and what ones have allowed them to increase by accumulations of interest during the year.

Four companies, the Atlantic and North Carolina; the Macon and Brunswick; the Selma and Meridian, and the San Antonio and Mexican Gulf, discharged their indebtedness during the year, paying to the United States the sum of \$86,563 89.

The indebtedness of ten companies, the Alexandria, Loudoun and Hampshire; the Alabama and Florida; the Alabama and Chattanooga; the East Tennessee and Virginia; the Mississippi and Tennessee; the Memphis and Ohio; the Memphis and Little Rock; the Pacific Railroad of Missouri; the Southwest Branch Pacific Railroad of Missouri, and the Selma, Rome and Dalton, have been reduced \$39,333 38. These companies, also, paid on account of interest, \$39,205 22, making the total payments from them \$78,538 10.

The indebtedness of eleven companies, the East Tennessee and Georgia; the Edgefield and Kentucky; the Knoxville and Kentucky; the McMinnville and Manchester; the Mississippi, Gainesville and Tusca-

loosa; the Mobile and Ohio; the Memphis, Clarksville and Louisville; the Nashville and Chattanooga; the Nashville and Northwestern, and the New Orleans and Ohio, has increased \$200,403 17. They have paid to the United States during the year, \$31,393 87.

The indebtedness of the Indianola Railroad Company remains as at the beginning of the year. That of the Washington, Alexandria and Georgetown was discharged on the 16th of August, 1871.

The principal increase of the indebtedness is on account of the Nashville and Chattanooga, the Nashville and Northwestern, the Nashville and Decatur, and the Memphis, Clarksville and Louisville Railroad Companies, the interest on which amounted to \$182,514 72, while the payments made by them were only \$7,362 79. I should state, however, that the Nashville and Chattanooga Railroad Company has performed mail service during the year, and has given this Department the required order on the Postmaster General for the amount, excepting for the service for the quarter ending the 30th of June, but this Department has thus far been unable to get the money so as to make the proper credit. The Nashville and Decatur Railroad Company has also performed service, but refuses to give the required order for the amount due; hence it has not been obtained and credited.

At the last session of the Forty-first Congress a bill was passed authorizing the Secretary of War, if he shall deem it advisable, by and with the advice of counsel of record in the suits pending, and the Attorney General of the United States, to compromise, adjust, and settle the same, upon such terms, as to amount and time of payment, as may be just and equitable, and best calculated to protect the interests of the Government.

On the 23d of June this office was advised by the Secretary of War that he had accepted the proposition of the Nashville and Chattanooga Railroad Company to pay in full of its indebtedness the sum of \$1,000,000, one-half the principal sum, \$500,000, payable ten years from June 1, 1871, the other half twenty years from same date, with interest, payable semi-annually on the 1st days of December and June in each year, at the rate of four per cent. per annum.

No progress has been made during the year in the suits against those companies which refuse to pay their debts, their prosecution being, for the time, suspended awaiting action under the bill above referred to.

Arrangements have been made with the Selma, Rome and Dalton Railroad Company under which payment of its debt in monthly installments of \$1,000 each in money is to be made, commencing on the 1st of October, 1871, and continuing for one year; thence for one year \$2,000 per month, and thereafter \$3,000 per month, until the debt is discharged. In addition to the foregoing payments, all postal earnings and earnings from military transportation are to be applied to the payment of the debt.

The claims of the Nashville and Chattanooga and Nashville and Northwestern Railroad Companies for use of and damage to their roads, &c., during the war, amounting respectively to \$4,557,092 64 and \$848,140 69, referred to this office by the Third Auditor of the Treasury Department, were returned with the recommendation that they be not allowed.

On the 12th of January, 1871, this office was advised by the Auditor that he had disallowed the claims, and that the Second Comptroller concurred in his action.

The claims of the East Tennessee and Virginia and East Tennessee and Georgia Railroad Companies of a similar nature, and amounting,

respectively, to \$751,200 07 and \$765,912 33, referred to this office by the Auditor, were returned on the 18th of July with a similar recommendation.

During the fiscal year I received from indebted railroad companies, in money and postal dues, \$173,420 39, all of which has been deposited in the Treasury of the United States, and also credited upon their indebtedness.

RAILROAD TRANSPORTATION.

The business of this Department in this branch of the service, during the fiscal year, may be reported (based upon data obtained from the reports of officers so far as rendered to this office) as follows :

Number of persons transported by railroad.....	35,001
Number of animals.....	3,839
Number of pounds of freight.....	63,660,523

The amounts paid by officers of this Department on account of railroad transportation, so far as reported, was \$478,438 02. In addition to this amount there were examined in this office, and referred for settlement at the Treasury, railroad accounts and claims amounting to the sum of \$1,520,478 33, making a total amount of \$1,998,916 35 paid for railroad transportation during the fiscal year.

Of this amount the following sums were allowed by this office on accounts of the Pacific railroads, and referred to the Treasury for settlement:

To the Union Pacific Railroad Company, 390 accounts.....	\$812,812 55
To the Kansas Pacific Railroad Company, 36 accounts.....	255,603 85
To the Central Pacific Railroad Company, 20 accounts.....	66,213 74
To the Western Pacific Railroad Company, 16 accounts.....	1,730 50
Total number of accounts, 462, amounting to \$1,136,360 64.	

The number of persons and weight of freight transported by these Pacific railroads for the Government during the year was as follows:

Union Pacific Railroad, 6,945 persons and 24,245,385 pounds of freight; Kansas Pacific Railroad, 4,323 persons and 10,526,215 pounds of freight; Central and Western Pacific Railroads, 478 persons and 977,188 pounds of freight.

Total number of persons, 11,746, and total number of pounds of freight, 35,748,788.

These figures are included in the grand total of the number of persons and pounds of freight transported by railroad, as above stated, during the fiscal year. The number and amount of the accounts of these Pacific railroads received at this office during the fiscal year was as follows:

Union Pacific Railroad, 65 accounts, amounting to \$514,407 04; Kansas Pacific Railroad, 35 accounts, amounting to \$246,162 44; Central Pacific Railroad, 13 accounts, amounting to \$5,108 51; Western Pacific Railroad, 18 accounts, amounting to \$1,370.

Total number of accounts, 131, aggregating a total amount of \$767,047 99.

In settlement with these Pacific railway companies one moiety of the amounts allowed for Government transportation is retained at the Treasury, under the acts of Congress incorporating these railroad companies, and applied in payment of the interest on the bonds issued in their behalf by the Government, and the other moiety is paid in money to the respective companies at the Treasury Department.

The accounts of the Sioux City and Pacific Railroad Company are set-

tled on the same basis as the other Pacific railroads, but no final settlements have been made with that road during the fiscal year.

Congress having at various times granted to several of the States public lands to aid in the construction of railroads, and provided in some cases "that the roads shall be and remain public highways, for the use of the Government of the United States, free from toll or other charges upon the transportation of any property or troops of the United States;" and in other cases, in addition to the foregoing proviso, "all property and troops of the United States shall at all times be transported over said railroads at the cost, charge, and expense of the company owning or operating the same;" and many questions having arisen as to which are land-grant roads, and what portions of particular roads are land-grant for the purposes aforesaid, I have deemed it necessary that a new table of land-grant railroads should be prepared, giving more full and complete information in relation thereto than any in use, to govern in the settlement with railroad companies of accounts for military transportation. Such a table is now being prepared, and will be ready for publication within a short time.

WAGON AND STAGE TRANSPORTATION.

There was considerable delay in securing the acceptance by responsible parties of the contracts for wagon transportation in Texas, made during the early part of the present year, resulting in much inconvenience and embarrassment to this Department.

When the proposals for the service were opened by the chief quartermaster of the Department, some of the parties offering proposals could not be found, others refused on some technical or frivolous ground to accept and enter into the contract when the award was made to them.

The same trouble was experienced to some extent in the last letting of the contracts for wagon transportation in the Department of Dakota.

The names of the defaulting bidders and the facts in each case were reported to the honorable the Secretary of War, by whom the matter was submitted for the action of the Department of Justice, under the laws and regulations for such cases made and provided. The result of the action taken by the Department of Justice has not yet been made known to this office.

The business by wagon transportation during the fiscal year is shown by the following figures:

Number of persons transported.....	3, 2-7
Number of pounds of freight transported.....	43, 383, 173

The amount paid for such transportation during the fiscal year by officers of this Department, so far as reported to this office, was \$1,310,606 24. In addition to this amount there were examined in this office, and referred to the Treasury for settlement, wagon-transportation accounts amounting to the sum of \$146,937 21, making a total amount paid for wagon transportation, of \$1,457,543 45.

The rates per 100 pounds per 100 miles paid for wagon-transportation service on the principal routes under contracts made at the last letting, are as follows: Route No. 2, for transportation in the Department of the Missouri, \$1 21. Route No. 3, embracing District of New Mexico, was merged into Route No. 2, at the last letting. Route No. 4, for transportation in Minnesota and Dakota, \$1 27, and the Montana route for transportation, in Montana, \$1 57½. These are the uniform rates during each month of the fiscal year. (See abstract of contracts for wagon transportation herewith, marked C.)

During the fiscal year 639 persons and 881,815 pounds of freight were transported by stage. During the same time \$39,169 40 were paid on such account by officers of this Department, and accounts amounting to \$4,161 80 were referred by this office to the Treasury for settlement, making a total sum of \$43,331 20, paid on account of stage transportation during the fiscal year.

For tolls during the fiscal year there was paid by officers of this Department and allowed on accounts referred by this office, for settlement at the Treasury, a total sum of \$18,098 31, and on claims of the United States military-railroad employes there has been allowed the sum of \$1,576 74.

WATER TRANSPORTATION.

Seven steamers and two schooners have been in service (under charter) of the Department during the fiscal year, at a cost of \$27,650 14.

Two steamers, two schooners, and two sloops, owned by the Department, have been employed, at a cost of \$24,104 19.

On April 4, 1871, the steamer Newberne, which was employed as a means of communication between San Francisco and Alaska, was sold for \$55,000 in coin, her services being no longer required on account of the withdrawal of troops from that Territory.

The movement of transportation by water during the fiscal year was, of persons, 37,195; of animals, 1,897; pounds of freight, 58,884,996.

Expended on water transportation during the fiscal year by officers of the Quartermaster's Department, \$624,055 59.

Allowed on claims referred by this office for settlement at the Treasury, \$55,283 90.

Since the close of the fiscal year the Quartermaster General, by authority of the Secretary of War, has ordered the construction of an iron steam-launch, at a cost of \$7,000, to be used as a means of communication between Fort Pulaski and Savannah, Georgia. The launch is to be 50 feet by 12 feet by 4 feet, with an engine of 10-inch cylinder.

A launch of this description is capable of carrying fifty or sixty passengers under an awning, and of towing barges or flat-boats laden with supplies.

It may be found advantageous to provide these launches for the service of the Quartermaster's Department in other localities. (For abstracts and statements in regard to water transportation see papers herewith, marked D, E, and F.)

The total number of persons transported by the Quartermaster's Department by rail, wagon, water, and stage, during the fiscal year ending June 30, 1871, was 76,122. The total number of animals so transported was 5,870, and the total weight of freight was 171,810,512 pounds. (See statement marked G, herewith.)

The amount paid by officers of the Quartermaster's Department during the fiscal year for passengers, was \$408,893 61; and for freight, \$2,032,321 41; and expenditures, \$11,054 23. Total amount paid by officers of the Quartermaster's Department, \$2,452,269 25. There were referred from this office to the Treasury Department during the fiscal year claims and accounts to the amount of \$1,746,536 25 for settlement, which, in addition to the amount paid by officers of this Department during the year, makes the sum of \$4,198,805 54 as the total amount paid for transportation by officers, and that referred for settlement by this office to the Treasury Department during the fiscal year. (See statements marked H and I, herewith.)

BARRACKS AND QUARTERS.

The principal operations in this branch of the service for the fiscal year may be noted as follows:

New buildings.—One hundred and thirty-five new buildings, such as barracks, officers' quarters, stables, store and guard houses, work-shops, &c., have been constructed, under the authority of the Secretary of War and direction of the Quartermaster General, at a cost of \$890,687. These buildings have been erected at the various military posts in Oregon, North Carolina, Kansas, Dakota, New Mexico, Michigan, Florida, Arizona, New York, Wyoming Territory, Idaho, Maryland, Nebraska, Nevada, Texas, Virginia, California, Louisiana, South Carolina, Massachusetts, Alabama, and Colorado.

Wharves.—Three new wharves have been constructed, at a cost of \$13,600.

Repairs.—The sum of \$89,859 has been authorized to be expended in making the necessary repairs, alterations, &c., and to preserve and place in proper condition the public buildings and wharves, and in construction and repairs of cisterns, wells, &c., at the various posts throughout the country.

The following table shows the department and divisions in which the buildings have been erected, repairs, &c., made, and the amounts expended in each:

Division of the Missouri:	
Department of the Missouri	\$216, 6-9
Department of the Platte	130, 0-0
Department of Dakota	104, 7-0
Division of the Atlantic:	
Department of the East	66, 7-4
Department of the Lakes	2, 2-9
Division of the South:	
Department of the South	54, 3-9
Department of Texas	394, 3-4
Division of the Pacific:	
Department of California	12, 6-1
Department of the Columbia	12, 4-6

RECAPITULATION.

Military Division of the Atlantic	\$69, 0-3
Military Division of the South	448, 6-1
Military Division of the Missouri	451, 3-9
Military Division of the Pacific	25, 6-1
	<hr/> 994, 14-6 <hr/>

New posts.—A new one-company post has been established by competent authority on the head-waters of the river Verde, Arizona. Also one at Sweet Water Mines, Wyoming Territory, to be known as "Camp Stambaugh."

Existing buildings.—The reports show that there are about 5,000 buildings of various kinds, in connection with the military service, for which this Department is responsible. Many of them are presumed to be of rude construction and of small cost.

Buildings sold.—Orders have been issued during the fiscal year for the sale, at public auction, of 194 buildings of various dimensions.

Bergen Heights Arsenal.—The Bergen Heights Arsenal, located in New Jersey, was, under the act approved February 3, 1871, sold at public auction to John Halliard for \$71,000 cash. Deed has been executed by the Secretary of War and sent to the chief quartermaster Depart-

ment of the East, for delivery. The original cost of the property was \$2,100.

Property transferred.—The armory building, located in this city, built for the use of the District militia, transferred to this Department in the early part of the war, has been vacated and turned over, by direction of the Secretary of War, to the Territorial authorities. The Government property which was stored therein was removed to No. 5 Water street, Georgetown, D. C., where suitable storage facilities were provided.

The Mount Vernon arsenal, located in Alabama, has been transferred by the Ordnance Department to the custody of this Department by authority of the Secretary of War.

The War Department has authorized the barracks and other buildings, located on Yerba Buena Island, California, in the harbor of San Francisco, held by the Engineer Department, to be transferred to the Quartermaster's Department "to be occupied for depot purposes and for sheltering troops, as circumstances may require."

The deeds, executed by John A. Parker and others, transferring to the United States, at a nominal sum, certain lots in Omaha as a site for headquarters building, were examined by the Department of Justice and reported as good and valid.

In my annual report for the year ending June 30, 1870, it was reported that the act of March 2, 1867, authorized an expenditure of \$150,000 for the erection of fire-proof warehouses at Jeffersonville, Indiana, and that "the city of Jeffersonville proposes to give a site to the Government for the buildings." I now have to report that, after an extended correspondence, the deeds executed by said city, transferring the site to the United States, have been examined by the Department of Justice and opinion rendered that they are good and sufficient.

Proposals for the necessary materials and work have been invited, and building operations will commence at an early day.

In the same annual report it was stated that the Secretary of War had authorized the construction of requisite buildings for the depot of San Antonio, Texas, a suitable site having been offered by the city of San Antonio. The Department of Justice having rendered favorable opinion on the deeds executed, instructions have been issued to commence the work. The cost of the buildings is estimated at \$100,000, and that sum has been remitted to the chief quartermaster Department of Texas for the purpose.

The erection of the buildings at both Jeffersonville and San Antonio is believed to be a wise and economical measure. The cost of new buildings at the former place will, in a few years, be saved in the reduction in the expense of watching and guarding the immense quantity of property valued at millions, and of repair of temporary sheds which have so long sheltered it; the cost of those at San Antonio, by the reduction of the rent-roll, which is now some \$20,000 to \$25,000 per annum.

Ventilating fire-places.—A board was convened in this city by authority of the War Department to examine and report upon the merits of "ventilating fire-places," submitted by the Surgeon General, and the advisability of their adoption for use in the Army. By direction of the Secretary of War the depot quartermaster in this city has been directed to have twenty-five manufactured for use and trial in the Departments of the Missouri, Platte, Dakota, of the Lakes, and the East.

Iron-frame barrack bunks.—The subject of iron-frame barrack bunks has for several years claimed the attention of this office, and an extended

correspondence has been conducted. Many patterns have, from time to time, been sent here as samples, and several have been forwarded to the different Departments for trial.

The best yet made are those known as the "barrack bunk" and the "composite chilled-iron bunk." Both patterns were adopted by the Secretary of War, July 28, 1871. The former is one modified by the Quartermaster General from several styles which have been received, and is not patented. It is so constructed that in the day-time the bunks can be stacked up in two or three tiers, but at night they are taken down and the men sleep in one tier. Its present cost is about \$7.

The one manufactured by the Composite Iron Works of New York City is made by a patent process, and quite a number have been ordered to be purchased during the last six months and shipped to various posts. I think this bunk, upon the whole, is better than the other; not only as better-looking, but is probably stronger and more durable than the "barrack bunk." Its present cost is \$8.

POST CEMETERIES.

By General Orders No. 45, Headquarters of the Army, series of 1868, commanding officers of posts are charged with the establishment and maintenance of post cemeteries.

So far as known here, the principal operations with regard to post cemeteries may be noted as follows:

At Fort Gratiot, Michigan, the remains of about 151 officers, soldiers, &c., have been removed to the city cemetery at Port Huron, the site of the post cemetery having been authorized to be sold under laws of July 20, 1868, and March 18, 1870.

The post cemetery at Fort Larned, Kansas, has been reduced to 250 feet square. The bodies buried on northwest of the post have been collected and removed to post cemetery, and a new fence has been erected.

The post of Carlisle Barracks having been abolished, orders have been issued to remove the bodies from post cemetery and reinter them in the lots in Ashland cemetery which are owned by the United States.

REGULAR SUPPLIES.

Public animals.—The following statement shows the number of animals, with their total and average cost, purchased in the several military departments during the fiscal year ending June 30, 1871:

Where purchased.	Cavalry horses.	Mules.	Total cost.	Average cost.
Department of the Lakes.....	*2	.....	\$425 00	\$212 50
Department of Texas.....	1140	.....	79,070 40	69 36
Department of the Missouri.....	300	.....	42,750 00	142 50
Department of the Platte.....	240	.....	32,592 00	136 20
Department of the Platte.....	.....	20	2,542 00	127 10
Department of Arizona.....	4	.....	560 00	140 00
Department of California.....	.....	20	3,249 84	162 49
Department of the Columbia.....	79	.....	5,925 00	75 00
Total.....	1763	40	167,114 24	.....

* Team-horses.

Sales.—The following is a tabular statement of the sales of public animals in the different departments, showing number sold and amount

realized. The large sale of mules was in execution of the order of the Secretary of War of May 11, 1870, for the reduction of the entire number of draught animals to 10,500 :

Departments.	Horses.		Mules.		Oxen.		Total.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
East	94	\$1,457 00	20	\$2,491 00			44	\$3,948 00
Lakes	6	192 00	3	228 00			9	420 00
South	56	5,053 50	127	17,619 10			183	22,672 60
Texas	209	8,567 24	643	31,409 70	3	\$48 99	855	40,025 93
Missouri	254	14,345 00	2079	195,411 43	4	88 50	2337	209,844 93
Platte	202	15,232 47	1156	97,920 88			1418	113,153 35
Dakota *	185	10,545 00	51	4,335 00	3	100 00	239	14,980 00
California	70	2,254 00	110	3,194 15	6	173 60	186	5,621 75
Arizona	37	1,498 00	15	245 00			52	1,743 00
Columbia	125	3,784 92	321	8,748 00	7	269 39	453	12,802 31
Depot Washington	4	180 00	1	150 00			5	340 00
Depot Jeffersonville	3	231 00	6	587 00			9	818 00
Total	1235	63,350 13	4532	362,339 26	23	680 48	5790	426,369 87

* Partly estimated.

Summary.—The following is a summary statement of the number of animals purchased, sold, died, &c., and remaining on hand during the fiscal year ending June 30, 1871 :

On hand, purchased, &c.	Horses.	Mules.	Oxen.
On hand July 1, 1870	8,225	14,968	155
Purchased	1,765	40	2
Taken up, &c.	956	414	.....
To be accounted for	10,946	15,422	157
Sold	1,235	4,532	23
Died	530	565	10
Lost and stolen	1,185	569	.....
Total sold, died, &c.	2,950	5,666	33
On hand June 30, 1871	7,996	9,756	124

ANNUAL ESTIMATES.

In accordance with estimates submitted to this office, regular and miscellaneous stores have been ordered supplied to the following-named posts in the Military Division of the Missouri, to meet the requirements of the service in the fiscal year 1871-72, viz: Fort Abercrombie, Fort Buford, Fort Benton, Fort Baker, Fort Bridger, Camp Brown, Camp Douglas, Fort Ellis, Fort Fetterman, Fort Kearney, Fort Rawlins, Fort Laramie, Fort McPherson, North Platte, Omaha Depot, Omaha Barracks, Fort Pembina, Fort Rice, Fort Randall, Fort Ripley, Fort D. A. Russell, Fort Russell Depot, Fort Shaw, Fort Ransom, Fort Sully, Fort Snelling, Fort Stevenson, Fort Sanders, Fort Steele, Sioux City, Sidney Barracks, Camp Stambaugh, Fort Totten, Fort Wadsworth.

In ordering these supplies it was directed that local contracts for fuel, forage, and straw should be made, where practicable, for such stores as were not on hand at any of the western depots. No building materials for extraordinary repairs were authorized to be furnished at any post without report and recommendation designating such repairs, and ref-

erence to requisition to, and approval by, the Hon. Secretary of War. At infantry posts the number of public animals was ordered reduced to the lowest standard compatible with the actual necessities of the service. Officers were instructed to avoid too great an accumulation of stores at the upper western posts, which are in a very cold region, and especially liable to accident of fire. As, however, communication with these posts is cut off in winter—the dangerous time—fall and winter supplies had to be provided in season; but it was suggested that the forage and fuel should not be stored too closely. The medical department having reported coal abundant in the mountains near Fort Ellis, Montana Territory, officers were instructed to make efforts to obtain coal, if cheaper than wood in that region.

REQUISITIONS.

There were received and acted upon during the fiscal year 372 requisitions for regular and miscellaneous supplies, as follows:

Depot of Washington	33
Depot of Jeffersonville	4
Military Academy, West Point	14
Military Division of the Atlantic	10
Military Division of the South	102
Military Division of the Missouri	180
Military Division of the Pacific	5
Miscellaneous sources	24
Total	372

Stores thus required were ordered to be supplied, where practicable, from stock on hand at general depots. Articles not thus available were ordered purchased in cheapest and most convenient markets.

FIRE-EXTINGUISHERS.

In addition to the machines previously ordered for various stations, and specified in the last annual report, the following posts have been supplied with fire-extinguishers of the most approved pattern:

Posts.	No. sent.
Fort Foote, Maryland	1
Baton Rouge, Louisiana	1
Jackson Barracks, Louisiana	3
Fort McIntosh, Texas	2
Fort Griffin, Texas	4
Fort Hays, Kansas	2
Fort Wallace, Kansas	4
Fort Dodge, Kansas	3
Fort Kit Carson, Indian Territory	2
Fort Reynolds, Colorado	2
Fort Laramie, Wyoming	3
Fort Sanders, Wyoming	6
Fort Fetterman, Wyoming	4
Camp Stambaugh, Wyoming	4
Omaha Depot, Nebraska	4
Headquarters Department Dakota	2
Fort Snelling, Minnesota	2
Fort Ripley, Minnesota	3
Fort Sully, Dakota, (hospital)	1
Whetstone Agency, Dakota	2
Grand River Agency, Dakota	2
Camp Baker, Montana Territory	2
Military Division of the Pacific	30
Total	89

The War Department building in this city has also been supplied with four fire-extinguishers of the best manufacture.

During the year fires occurred at the posts of Fort Hays, Kansas, Fort D. A. Russell, Wyoming, Fort Ripley, Minnesota, and depot of San Antonio, Texas. The flames were extinguished by prompt use of the extinguishers, and much valuable property saved. At Fort Buford, Dakota, where a fire occurred last January, the machines were rendered inefficient by the intensity of the cold, the thermometer being 14° below zero. The fire was extinguished by water drawn from the river.

HORSE SHOEING.

The board of officers which met at Fort Riley, Kansas, in January last, for the purpose of examining the manuscript of a work entitled "Hints on Horse-shoeing, by John Kiernan, Farrier," with accompanying plates, papers, &c., having tested, by practical experiment, the value of the proposed system of preparing the horse's foot and fitting shoes, recommended the adoption of the system throughout the Army, and the publication of the work, including the plates. The Secretary of War, upon recommendation of the Quartermaster General, authorized the printing of the work at the Congressional Printing Office. The Public Printer having reported that he had no facilities for engraving the plates, they were ordered executed at a private lithographic establishment in this city. When the book is published it is intended to distribute it to officers of the cavalry and the artillery, and the Quartermaster's Department, for their information and guidance.

PACK-SADDLES.

Requisitions for "aparejos," or Mexican pack-saddles, having been forwarded from some posts in the Department of the Missouri, and the opinions of officers of experience being widely different as to the comparative merits of the present army pack-saddle and the Mexican aparejo, the commanding general of the department was left to decide the question of supplying the latter kind in view of the number of pack-saddles on hand, and of the diverse opinions of officers who had been consulted on the subject. But the Quartermaster General expressed concurrence in the opinions of Inspector General Marcy, Assistant Quartermaster General Rucker, and Deputy Quartermaster General Easton, to the effect that the pack-saddle which we have already is better than the aparejo.

EXPLORING EXPEDITIONS.

Under orders from the War Department of date March 18, 1871, Lieutenant George M. Wheeler, Corps of Engineers, was assigned to the charge of the exploration, under the direction of the Chief of Engineers, of those portions of the United States territory lying south of the Central Pacific Railroad, embracing parts of Eastern Nevada and Arizona; and the Quartermaster General, in addition to the transportation and supply of the escort, was instructed to procure the necessary animals and forage them en route, furnishing transportation from the east to San Francisco, and thence to the field, for the civilian assistants of Lieutenant Wheeler and the subsistence stores, instruments, &c. These orders were promptly executed.

The Secretary of War having granted the necessary authority, under date of April 24, 1871, the required means of transportation and forage

were also provided, under instructions from this office, for the exploration of the 40th parallel, in charge of Professor Clarence King, geologist.

CONTRACTS.

Five hundred and eighty-seven contracts were examined and filed during the fiscal year, as follows: 198 for forage, (including bran,) embracing 251,896 bushels of corn, 266,734 bushels of oats, and 41,413 tons of hay; 49 for forage, quantities as required; 12 for both forage and fuel; 6 for straw, 2,392 tons; 27 for coal, 483,457 bushels, and 25,089 tons; 102 for wood, 93,150 cords; 14 for wood, quantities as required; 10 for charcoal, 20,399 bushels; 20 for building materials; 16 for repairing and constructing buildings; 35 for transportation; 11 for services, miscellaneous; 8 for cavalry horses, 1,550; 4 for clothing, camp and garrison equipage; 2 for stationery; 3 for quartermasters' supplies, miscellaneous; 25 for national cemeteries; 2 for charters; 43 for leases.

ISSUES.

The issues of forage and straw during the fiscal year have been as follows: Corn, 770,660 bushels; oats, 1,059,601 bushels; barley, 175,113 bushels; hay, 51,165 tons; straw, 3,962 tons.

The issues of fuel have been: Wood, 124,372 cords; anthracite coal, 19,492 tons; bituminous coal, 9,186 tons.

CLAIMS.

The examination and settlement of claims and accounts pertaining to the different branches of this office, under my direction, has been carried on during the past fiscal year as rapidly as the clerical force would permit.

Much care and labor have necessarily to be devoted to this branch of the business.

For report of transportation claims and accounts on hand at the commencement of the fiscal year, those received, those acted upon, and those still remaining on hand at the close of the fiscal year, see statement marked I, herewith.

For similar report of miscellaneous claims, see statement marked K, herewith; and for similar report of claims filed under the act of July 4, 1864, chapter 240, see statement marked L, herewith.

A general statement of the business of the office for the fiscal year, with reference to claims, being a recapitulation of those above mentioned, is submitted herewith, and is marked M.

In the preparation of the statements above mentioned, it was necessary to examine all the claim records of the office, during which the information contained in the accompanying statements marked N and O was elicited, and may be of interest as showing the extent and importance of the claim business of the office.

RECORDS AND FILES.

Under the instructions of the War Department of October 1, 1870, providing for a new system of records, &c., for the several bureaus of the War Department, the necessary books were prepared, and on the 1st of January, 1871, were opened.

The entire force of clerks engaged in keeping the records is not under

my direction, but the application of the system to the business of the branches under my supervision has been attended with satisfactory results, and I am advised it works well throughout this office.

Very respectfully, your obedient servant,

M. I. LUDINGTON,
Quartermaster, United States Army.

A.—Statement of public funds in the possession of Major M. I. Ludington, Quartermaster, United States Army, during the fiscal year ending June 30, 1871.

On hand July 1, 1870	Nothing.
Received from officers during the year	\$352 74
Received from Treasury Department during the year	14 60
Received from sales of railway property during the year	173, 420 39
Received from other sources during the year	Nothing.
Total	<u>173, 787 73</u>
Disbursed during the year	Nothing.
Transferred to other officers during the year	\$14 60
Deposited to the credit of the Treasurer of the United States during the year	173, 773 13
Remaining on hand June 30, 1871	Nothing.
Total	<u>173, 787 73</u>

Respectfully submitted.

M. I. LUDINGTON,
Quartermaster, United States Army.

B.—Statement of the indebtedness of certain railroad companies for railway material and rolling stock purchased under provisions of Executive orders of August 8 and October 14, 1865, and orders of the Quartermaster General, United States Army, for the year ending June 30, 1871.

Number.	Name of company indebted to the United States July 1, 1870.	Value of property sold.	Interest on same to June 30, 1871.	Total expenses to June 30, 1871.	Total principal, inter- est, and expenses to June 30, 1871.	Balance of principal unpaid July 1, 1870.	Balance of interest unpaid July 1, 1870.	Expenses unpaid July 1, 1870.	Total principal, inter- est, and expenses unpaid July 1, 1870.	Interest and expenses for the year ending June 30, 1871.
1	Alexandria, Loudoun and Hampshire	\$62,392 96	\$19,494 69	\$175 73	\$82,953 38	\$16,597 21	\$163 96		\$16,763 17	\$946 03
2	Atlantic and North Carolina	51,453 83	11,040 15		62,494 04	4,667 84	38 01		4,695 85	
3	Alabama and Florida	27,109 04			27,109 04	12,152 12			12,152 12	
4	Alabama and Chattanooga	30,248 52	11,158 42	123 98	41,530 92	19,449 08			19,449 08	
5	East Tennessee and Georgia	366,183 92	148,080 33	9,322 73	516,586 08	350,447 58	21,292 63		371,740 21	1,342 92
6	East Tennessee and Virginia	985,655 65	107,734 44	9,322 73	375,712 82	949,228 81	7,263 63		956,492 44	25,636 88
7	Edgfield and Kentucky	114,772 86	47,488 17	1,145 00	163,246 03	114,772 86	37,184 16	\$245 00	152,502 02	18,247 95
8	Indiana	20,000 00			20,000 00	15,000 00			15,000 00	8,978 48
9	Knoxville and Kentucky	12,325 63	3,570 16	154 97	16,060 06	9,544 00	960 68		9,405 57	696 59
10	McMinnville and Manchester	46,508 54	17,657 77	9,175 20	66,241 51	46,508 54	14,259 92	1,575 90	62,343 66	3,995 00
11	Mississippi, Gainesville and Tuscaloosa	33,476 39	13,831 31	67 75	47,475 35	33,476 39	8,930 36		37,406 75	2,511 51
12	Macon and Brunswick	28,990 00	4,861 44	61 80	31,743 24	3,855 21	104 85		3,960 06	161 15
13	Mobile and Ohio	505,143 70	74,829 20		579,972 90	74,829 05	1,975 55		76,804 60	5,421 64
14	Mississippi and Tennessee	127,750 52	29,318 85	1,945 00	157,069 37	29,128 13	1,196 07	50 00	30,326 20	1,710 24
15	Memphis, Clarksville and Louisville	326,832 36	138,292 56		475,529 92	326,832 36	83,616 97		420,509 33	95,196 04
16	Memphis and Ohio	106,229 13	22,998 72		129,227 81	12,610 92	118 53		12,729 55	667 78
17	Memphis and Little Rock	153,673 69	41,015 44	75 40	194,767 53	15,315 96	488 11		16,804 07	5,794 08
18	Nashville and Chattanooga	1,566,451 73	615,631 70	2,224 12	2,184,417 55	1,474,202 58	289,964 90		1,764,171 45	98,771 64
19	Nashville and Northwestern	523,401 26	931,515 02	2,224 11	1,457,140 39	531,192 58	141,915 22	590 26	673,098 06	38,047 01
20	Nashville and Decatur	405,125 92	123,531 99	3,392 35	529,344 26	280,680 10	19,745 90	274 35	300,840 35	90,409 83
21	New Orleans and Ohio	22,150 00	12,082 94	4,647 90	48,900 14	37,961 19	3,919 95	1,114 89	39,986 13	2,042 18
22	Pacific Railroad of Missouri	125,453 65			125,453 65	20,774 90			20,774 90	
23	Southwest branch Pacific Railroad of Missouri	57,115 94			57,115 94	57,115 94			57,115 94	
24	Selma and Meridian	146,297 92	23,936 70	568 00	170,792 61	23,758 48	323 19		24,081 60	1,522 83
25	Selma, Rome and Dalton	183,276 40	66,462 07	53 95	249,792 51	147,156 23	1,883 60		149,039 83	10,495 72
26	San Antonio and Mexican Gulf	48,775 19	17,048 49	4 25	65,827 93	47,110 68	3,383 75		50,504 43	1,037 97
27	Washington, Alexandria and Georgetown				65,324 06	217 61			217 61	
	Total	5,578,134 60	1,771,960 61	79,913 57	7,170,028 78	4,010,335 01	632,037 87	4,149 40	4,646,522 68	274,323 71

B.—Statement of the indebtedness of certain railroad companies for railway material and rolling stock, &c.—Continued.

Number.	Name of company indebted to the United States July 1, 1870.	Total to June 30, 1871.	Increase of the debt during the year.	Decrease of the debt during the year.	Total payments to July 1, 1870.	Payments made dur- ing the year ending June 30, 1871.	Total payments made to July 1, 1871.	Balance of interest un- paid July 1, 1871.	Expenses unpaid July 1, 1871.	Installments unpaid July 1, 1871.
1	Alexandria, Loudoun and Hampshire	\$17,709 20		\$4,803 97	\$64,554 18	\$5,750 00	\$70,304 18	\$123 10		\$11,836 10
2	Atlantic and North Carolina	4,685 85		4,685 85	57,798 23	4,685 85	62,484 08			
3	Alabama and Florida	19,182 12		14,296 92	801 31	801 31	15,728 23			
4	Alabama and Chattanooga	20,792 00		691 45	20,738 92	2,034 37	22,773 29	876 18		17,891 45
5	East Tennessee and Georgia	397,377 19	\$4,365 30		119,318 99	21,371 58	140,560 57	25,557 93		26,258 70
6	East Tennessee and Virginia	274,745 39		1,349 20	100,967 43	19,597 15	130,564 58	5,919 43		949,238 81
7	Edgewood and Kentucky	161,480 44	8,978 42		1,865 59		1,865 59	45,562 58	\$1,145 00	114,773 86
8	Indiana	15,000 00			5,000 00		5,000 00			
9	Knoxville and Kentucky	10,592 16	336 09		5,557 90	360 50	5,918 40	596 77		9,544 89
10	Memphis and Manchester	66,337 76	3,995 10		3,75		17,654 02	2,175 90		46,508 54
11	Mississippi, Gainesville and Tuscaloosa	29,918 26	212 51		7,557 09	2,299 00	9,856 09	4,142 87		33,476 39
12	Mobile and Ohio	41,121 21	5,421 64		27,622 03	4,121 21	31,743 24			71,674 14
13	Memphis, Clarksville and Louisville	81,666 24		12,965 50	494,306 66	14,675 74	494,306 66			1,500 00
14	Memphis and Ohio	31,036 44	23,468 33		126,039 83	1,727 71	124,492 96	106,735 30	400 00	336,832 36
15	Memphis and Little Rock	13,396 33		520 59	30,764 55	1,198 37	117,729 95	357 58		11,840 38
16	Nashville and Chattanooga	87,634 15	93,160 96	1,278 48	116,531 58	7,073 56	114,203 14	2,467 75		49,996 84
17	Nashville and Little Rock	1,862,943 99	38,092 81		107,130 58	5,610 88	397,063 14	363,125 86	566 06	521,192 58
18	Nashville and Northwestern	701,745 07	20,499 83		321,474 26	24 20	47,428 08	40,245 73	274 35	240,630 10
19	Nashville and Decatur	35,038 31	2,042 18		208,008 08		2,808 08	5,962 13	1,114 99	27,961 19
20	New Orleans and Ohio	20,774 90		9,052 63	13,781 83	9,058 63	113,718 08			
21	Pacific Railroad of Missouri	35,038 31		1,000 00	104,659 45		1,000 00			1,000 00
22	Southwest branch Pacific Railroad of Missouri	27,115 24		24,081 60	145,228 28	25,604 43	170,832 71			107,666 83
23	Selma and Meridian	55,604 43		6,854 25	90,256 86	17,349 97	65,897 93	1,636 48		140,549 20
24	Selma, Rome and Dalton	159,525 65		50,504 43	13,645 53	52,142 40	65,897 93			
25	San Antonio and Mexican Gulf	59,149 40			13,645 53		65,897 93			
26	San Antonio and Mexican Gulf	217 61			13,645 53		65,897 93			
27	Washington, Alexandria and Georgetown	4,920,246 39	200,403 17	122,575 32	2,240,162 39	196,495 86	2,445,678 25	828,443 31	5,675 60	1,946,904 53
	Total									

B.—Statement of the indebtedness of certain railroad companies for railway material and rolling stock, &c.—Continued.

Number	Name of company indebted to the United States July 1, 1870.	Total interest, unpaid July 1, 1871.	Balance principal unpaid July 1, 1871.	Total principal, interest, and expenses un- paid July 1, 1871.	Terms of payment.
1	Alexandria, Loudoun and Hampshire	\$11,939 20	\$11,836 10	\$11,939 30	Due June 30, 1869, \$5,000, payable monthly in money.
2	Atlantic and North Carolina .....	.....	.....	.....	Debit discharged July 31, 1870.
3	Alabama and Florida .....	.....	11,360 81	11,360 81	Transportation and postal service applied to liquidation of debt.
4	Alabama and Chattanooga	18,757 63	17,881 45	18,757 63	Due April 30, 1871. To be paid in monthly installments of \$2,000 cash.
5	East Tennessee and Georgia	53,816 63	350,447 58	376,005 51	Interest payable monthly in money; company to be credited postal and trans- portation service. Suit pending.
6	East Tennessee and Virginia	255,148 24	249,238 81	255,148 24	Due January 4, 1870. Suit pending.
7	Edgefield and Kentucky	161,480 44	114,772 86	161,480 44	Due October 31, 1870. Suit pending.
8	Indiana .....	.....	15,000 00	15,000 00	Payable in transportation service.
9	Knoxville and Kentucky	10,141 66	9,544 69	10,141 66	Due August 30, 1869.
10	McMinnville and Manchester	66,337 76	46,508 54	66,337 76	Due July 1, 1869.
11	Mississippi, Gainesville and Tuscaloosa	37,619 26	33,476 39	37,619 26	Due August 31, 1869.
12	Macon and Brunswick .....	.....	.....	.....	Debit discharged January 25, 1871.
13	Mobile and Ohio	79,071 33	74,269 05	81,666 34	Interest and \$3,000 payable monthly in money; company to be credited postal and transportation service.
14	Mississippi and Tennessee	1,620 18	16,240 52	16,360 70	Due October 31, 1869. Suit pending.
15	Memphis, Clarksville and Louisville	444,067 66	336,932 36	444,067 66	Due February 25, 1869.
16	Memphis and Ohio	12,197 96	11,840 38	12,197 96	Interest and \$1,000 payable monthly in money; company to be credited postal and transportation service.
17	Memphis and Little Rock	45,394 59	78,063 84	80,561 59	Net earnings payable monthly. Suit pending.
18	Nashville and Chattanooga	383,125 86	1,474,206 55	1,857,332 41	Due November 30, 1868. Suit pending.
19	Nashville and Northwestern	701,720 87	701,720 87	701,720 87	Interest and installments payable monthly.
20	Nashville and Decatur	321,340 18	290,820 10	321,340 18	Due. Suit pending.
21	New Orleans and Ohio	35,038 31	37,961 19	35,038 31	Payable in transportation service; one-half to be applied.
22	Pacific Railroad of Missouri	11,715 57	11,715 57	11,715 57	Debit discharged June 13, 1871.
23	Southwest branch Pacific Railroad of Missouri .....	.....	56,115 24	56,115 24	\$1,000 payable monthly in money for one year from October 1, 1871; thence for one year \$2,000; thence \$3,000 until debt is paid.
24	Solima and Meridian .....	.....	.....	.....	Debit discharged June 14, 1871.
25	Solima, Rome and Dalton	142,185 68	140,549 20	142,185 68	Payable in transportation service.
26	San Antonio and Mexican Gulf .....	.....	.....	.....	.....
27	Washington, Alexandria and Georgetown .....	.....	217 61	217 61	.....
	Total	9,781,083 44	3,890,321 62	4,724,350 53	.....

NOTE.—The Quartermaster General has been advised by the Secretary of War that the debt of the Nashville and Chattanooga Railroad Company has been compromised for one million of dollars, payable one-half in ten and one-half in twenty years from 1st June last, with interest at the rate of four per cent, per annum, payable semi-annually, 1st December and 1st June, of each year; but as there are some credits to be given for services rendered prior to 1st June, (as soon as the accounts can be examined,) the indebtedness is stated as it stood on that day.

Railroad companies which have discharged their indebtedness to the United States.

Number.	Name of company.	Value of property sold.	Interest on same to June 30, 1871.	Total expenses to June 30, 1871.	Total principal, interest, and expenses to June 30, 1871.	Total payments.	Remarks.
1	Richmond, Fredericksburgh and Potomac	\$7,449 37	.....	.....	\$7,449 37	\$7,449 37	Debt discharged January 1, 1866.
2	Georgia Railroad and Banking Company	11,935 05	.....	.....	11,935 05	11,935 05	Debt discharged January 12, 1866.
3	Southwestern	46,159 89	.....	.....	46,159 89	46,159 89	Debt discharged May 4, 1866.
4	Macon and Western.	83,638 15	.....	.....	83,638 15	83,638 15	Debt discharged November 24, 1866.
5	South Carolina	23,456 50	.....	.....	23,456 50	23,456 50	Debt discharged January 31, 1867.
6	Muscogee	5,244 20	\$1,446 76	.....	5,690 96	5,690 96	Debt discharged May 15, 1867.
7	Petersburgh	65,000 00	3,493 80	.....	68,493 80	68,493 80	Debt discharged August 23, 1867.
8	Memphis and Charleston	547,494 09	30,889 64	.....	578,383 73	578,383 73	Debt discharged October 16, 1867.
9	Mobile and Great Northern.	14,637 73	1,192 35	.....	15,830 08	15,830 08	Debt discharged October 31, 1867.
10	New Orleans, Jackson and Great Northern	900,865 58	15,556 91	.....	916,422 49	916,422 49	Debt discharged February 29, 1868.
11	Mississippi Central	78,460 00	6,968 56	.....	85,428 56	84,928 56	Debt discharged April 11, 1868.
12	Virginia and Tennessee	102,880 00	14,371 05	.....	117,251 05	117,251 05	Debt discharged April 16, 1868.
13	Montgomery and West Point	38,559 66	3,324 83	.....	41,884 50	41,884 50	Debt discharged July 16, 1868.
14	Virginia Central	70,000 00	10,364 66	.....	80,364 66	80,364 66	Debt discharged July 21, 1868.
15	Rome	22,066 05	1,778 37	.....	23,844 42	23,844 42	Debt discharged August 10, 1868.
16	Western and Atlantic.	472,944 66	70,194 71	.....	543,139 37	543,139 37	Debt discharged August 27, 1868.
17	Orange and Alexandria	118,895 74	12,497 44	.....	131,393 18	131,393 18	Debt discharged October 3, 1868.
18	Manassas Gap.	4,623 51	864 87	.....	5,488 38	5,488 38	Debt discharged October 8, 1868.
19	Winnington and Weldon	81,500 00	9,946 31	.....	91,446 31	91,446 31	Debt discharged November 4, 1868.
20	Alabama and Florida	51,912 00	6,355 18	.....	58,267 18	58,267 18	Debt discharged May 31, 1869.
21	New Orleans, Opelousas and Great Western	113,773 45	11,947 35	.....	125,720 80	125,720 80	Debt discharged August 21, 1869.
22	Norfolk and Petersburg	2,112 00	.....	.....	2,112 00	2,112 00	Debt discharged January 11, 1869.
23	Western North Carolina	14,269 82	2,024 06	\$48 00	16,401 90	15,401 90	Debt discharged June 6, 1870.
	Total	2,177,899 35	203,541 74	48 00	2,381,489 09	2,381,489 09	

I certify the above statement to be correct.

M. I. LUDINGTON,
*Quartermaster, United States Army,
 In charge of railroad indebtedness.*

C.—Abstract of contracts for wagon transportation entered into by the Quartermaster's Department during the fiscal year ending June 30, 1871.

Names of officers.	Names of contractors.	Date of contract.	Route of supply.	Rates.	Date of expiration of contract.
Lt Col. James A. Ekin, chief quartermaster Department of Texas.	Kendoy & King.....	Jan. 17, 1871	From Ringgold Barracks to Fort McIntosh, Texas.	\$1 18 per 100 lbs. per 100 miles.	June 30, 1871.
Do.....	W. C. Kruger.....	March 16, 1871	From Indiana, or terminus of Texas Central Railroad to San Antonio.	\$1 594 per 100 lbs. per 100 miles.	June 30, 1871.
Do.....	Adams & Wicks.....	March 6, 1871	From San Antonio to Forts McIntosh, Duncan, Clark, McKavitt, Concho, Stockton, Davis, Griffin, &c., Texas.	\$1 53 per 100 lbs. per 100 miles.	June 30, 1871.
Do.....	Robert Colwell, superintendent Galveston, Houston and Henderson R. R. Co.	Jan. 17, 1871	Galveston to Bremond, Texas.....	\$0 56 per 100 lbs. per 100 miles.	June 30, 1871.
Do.....	Adams & Wicks.....	Jan. 17, 1871	Bremond to Forts Griffin and Richardson, Texas	\$3 53 per 100 lbs. per 100 miles	June 30, 1871
Major R. Saxton, chief quartermaster Department of Columbia.	R. Grant.....	May 15, 1871	From Dallas to Camp Warner, Oregon.....	\$6 74 per 100 lbs. for the distance.	June 30, 1872
Do.....	J. M. Clark.....	May 15, 1871	From Dallas to Camp Harney, Oregon.....	\$4 13 per 100 lbs. for the distance.	June 30, 1872
Do.....	R. Grant.....	May 15, 1871	From Portland to Fort Klamath, Oregon.....	\$5 25 per 100 lbs. for the distance.	June 30, 1872
Do.....	O. W. Weaver.....	May 15, 1871	From Wallula to Fort Colville, Wash. T.....	\$3 90 per 100 lbs. for the distance.	June 30, 1872
Do.....	J. M. Stephenson.....	May 15, 1871	From Wallula, Wash. T., to Fort Boise, Idaho T.	\$3 80 per 100 lbs. for the distance.	June 30, 1872
Lt Col. S. B. Holabird, chief quartermaster Department of Dakota.	E. G. MacLay.....	March 3, 1871	Between posts in Montana.....	\$1 574 per 100 lbs. per 100 miles.	March 31, 1872
Do.....	N. R. Spurr.....	Feb. 14, 1871	From St. Paul, St. Cloud, and other points in Minnesota and Dakota, to the posts therein.	\$1 27 per 100 lbs. per 100 miles.	March 31, 1872
Lt Col. L. C. Eaton, chief quartermaster Department of Missouri.	E. Ballers.....	March 4, 1871	From points on Kansas Pacific R. R. to posts in State of Kansas and Territories of Colorado, Indian, and N. Mex.	\$1 21 per 100 lbs. per 100 miles	March 31, 1872
Do.....	W. C. Graham.....	April 23, 1871	St. Louis to Fort Sill, Indian T., and Forts Griffin and Richardson, Texas.	\$3 70 \$4 70, and \$5 70 per 100 lbs., respectively.	June 30, 1871.
Lt. F. H. Phipps.....	William Glendenning.....	June 19, 1871	Carriage in and about city of Augusta, Ga.	Reasonable rates.....	June 30, 1872
Major James Belger, quartermaster, New Orleans.	J. L. Wilbur.....	June 20, 1871	Carriage in and about city of New Orleans.....		June 30, 1872
Major C. G. Sawtelle, chief quartermaster Department of California.	Sachs Brothers.....	May 16, 1871	From San Francisco to Camp Klamath.....	54 cts. (coin) per lb. for the distance.	October 31, 1871.
Do.....	J. A. Brown.....	May 28, 1871	Corinne, Utah, to Fort Hall, Idaho T.....	14 cts. (coin) per lb. for the distance.	June 30, 1872
Do.....	J. Greenebaum.....	May 16, 1871	San Francisco to Camp Gaston, Cal.....	2 cts. (coin) per lb. for the distance.	October 31, 1871.
Do.....	Ellis & Hutchison.....	May 15, 1871	San Francisco to Camp Wright, Cal.....	3.02 cts. (coin) per lb. for the distance.	October 31, 1871.

Do.....	Whitney & Company.....	May 22, 1861	From Reno, Nev., to Camp Bidwell, Cal. From Reno, Nev., to Camp Warner, Oregon. Winnemucca, Nebr., to Camp Three Forks, Idaho T. Winnemucca, Nebr., to Fort Boise, Idaho T. From Bryan, Wyoming T., or other posts on Union Pacific R. R., to Camps Stambaugh and Brown, Wyoming T.	4. 75 cts. (gold coin) per lb. for the distance. 5. 70 cts. (gold coin) per lb. for the distance. 4 cts. (gold coin) per lb. for the distance. 5½ cts. (gold coin) per lb. for the distance. \$2 41½ per 100 lbs. per 100 miles.	October 30, 1871.
Major A. J. Perry, chief quartermas- ter Department of the Platte.	Sidney Tiehnor.....	June 29, 1871			June 30, 1872.

Respectfully submitted.

M. I. LUDINGTON,
Quartermaster U. S. A.



D.—Statement of vessels chartered, impressed, or employed by the Quartermaster's Department during the fiscal year ending June 30, 1871.

Name.	Class.	Tonnage.	Where chartered, impressed, or employed.	Period of service.		Where charter money is payable.	By whom put in service.	Rate per day, &c.	Amount paid.	Amount unpaid.	Total earnings.
				From—	To—						
U. S. Grant*	Steamer	.....	Aug. 1, 1870	Aug. 1, 1870	June 30, 1871	Astoria, Oreg.	Major R. Saxton, Q. M.	\$450 a month	\$6,742 54	.....	\$6,742 54
Unknown*	do	.....	Mar. 10, 1870	Mar. 10, 1870	June 30, 1871	Portland, Oreg.	Major R. Saxton, Q. M.	300 a month	3,795 60	.....	3,795 60
Henry Smith	do	108	June 1, 1869	July 1, 1870	June 30, 1871	New York, N. Y.	Colonel R. Ingalls, A. Q. M. G.	45 a day	16,425 00	.....	16,425 00
Eliza Hancock	do	.....	Nov. 26, 1870	Nov. 26, 1870	Mar. 18, 1871	Savannah, Ga.	Lt. C. M. Callahan, A. A. Q. M.	75 a day	925 00	.....	925 00
General Scott	do	.....	June 14, 1871	June 14, 1871	June 14, 1871	do	Lt. J. H. McCauley, A. A. Q. M.	75 a day	75 00	.....	75 00
Ajax	Steam-tug	.....	Sept. 13, 1870	Sept. 13, 1870	Sept. 13, 1870	do	Lt. C. M. Callahan, A. A. Q. M.	50 a day	50 00	.....	50 00
Colonel Woodruff	do	.....	June 23, 1870	June 26, 1871	June 26, 1871	Mobile, Ala.	Lt. S. R. Clark, A. A. Q. M.	50 a day	95 00	.....	95 00
Sea Bird	Schooner	.....	Jan. 8, 1871	Jan. 8, 1871	Jan. 13, 1871	Key West, Fla.	Lt. L. Smith, A. A. Q. M.	95 a voyage.	95 00	.....	95 00
Whalper	do	125	Dec. 23, 1870	Dec. 25, 1870	Dec. 25, 1870	do	Lt. L. Smith, A. A. Q. M.	147 a voyage.	147 00	.....	147 00
Total	.....	.....	.....	.....	.....	.....	.....	.....	27,650 14	.....	27,650 14

* This vessel made extra trips, for which it received additional pay.

† Employed at different times.

Correct.

M. I. LUDINGTON, Quartermaster, U. S. A.

E.—Statement of vessels owned or purchased by the Government, and employed in the Quartermaster's Department during the fiscal year ending June 30, 1871.

Name.	Class.	Tonnage.	When purchased or built, &c.	Estimated value or cost.	By whom employed.	Where employed.	Amount paid for repairs, &c.	Remarks.
General McPherson	Steamer	95	Sept. —, 1867	\$40,000	Major C. G. Sawtelle, Q. M.	San Francisco, Cal.	\$5,201 64	Constructed September, 1867.
Newbern	do	920	Aug. 31, 1868	100,000	Major C. G. Sawtelle, Q. M.	San Francisco, Cal.	10,856 66	Sold April 4, 1871, for \$53,000 coin.
Matchless	Schooner	170	June 5, 1863	13,500	Major R. Saxton, Q. M.	Key West, Fla.	5,325 00	
Margaret	do	22	Feb. 9, 1864	2,700	Major R. Saxton, Q. M.	Portland, Oreg.	2,710 89	
Salle	do	.....	.....	.....	.....	Fort Pike, La.	No expense.	
Sloop	Sloop	24	.....	750	.....	Fort Warren, Mass.	No expense.	
Total	.....	.....	.....	.....	.....	.....	24,104 19	

Correct.

M. I. LUDINGTON, Quartermaster, U. S. A.

F.—Abstract of contracts for water transportation entered into by the Quartermaster's Department during the fiscal year ending June 30, 1871.

Name of officer.	Name of contractor.	Date of contract.	Route of supply.	Rates.	Date of expiration of contract.
Major R. Saxton, quartermaster....	J. H. D. Gray.....	Aug. 1, 1870	Astoria to Fort Stevens, Oregon, and Cape Disappointment.	\$4 50 a month, \$6 an hour for detention, and \$30 for each extra trip, in coin.	July 1, 1871.
Major R. Saxton, quartermaster....	Hooper, Whiting & Co.....	July 1, 1870	San Francisco, California, to Tucson, Arizona, via Yuma Depot.	8¢ cents per pound, in coin.	June 13, 1871.
Major A. R. Eddy, quartermaster....	Mobile Trade Company.....	July 1, 1870	Mobile, Alabama, to Montgomery, and Tuscaloosa, Alabama.	Schedule rates.....	June 30, 1871.
Lt. Col. J. A. Ekin, deputy quartermaster general.	Kenedy & King.....	Jan. 1, 1871	Brazos, Santiago, to Fort Brown and Ringgold Barracks, Texas.	50 and 85 cents per 100 pounds, for freight.	June 30, 1871.
Lt. Col. J. A. Ekin, deputy quartermaster.	Kenedy & King.....	Jan. 1, 1871	Brazos, Santiago, to Fort Brown and Ringgold Barracks, Texas.	Schedule rates for troops	June 30, 1871.
Captain William Myers, assistant quartermaster.	Thomas Stackpole.....	Oct. 24, 1870	Washington, D.C., to Forts Foote and Washington.	\$10 a day.....	June 30, 1871.
Lt. Col. J. A. Ekin, deputy quartermaster general.	C. A. Whitney & Co., agents of Charles Morgan.	July 15, 1870	New Orleans, Louisiana, to Galveston, Indianola, Brazos, Santiago, and return.	Schedule rates.....	June 30, 1871.
Col. D. H. Knicker, assistant quartermaster general.	L. E. Hazlett.....	Mar. 17, 1871	Sioux City, Iowa, to Fort Benton, Montana, and intermediate points and return.	Schedule rates.....	Oct. 31, 1871.

Correct.

M. I. LUDINGTON,
Quartermaster, U. S. A.

G.—Statement of all troops and stores transported under the direction of the Quartermaster's Department during the fiscal year ending June 30, 1871.

Kind of transportation.	PASSENGERS.			ANIMALS.			STORES.						
	Officers.	Men.	Total passen- gers.	Horses.	Mules.	Cattle.	Total number of animals.	Pounds of com- munity stores.	Pounds of quar- termaster stores.	Pounds of ord- nance stores.	Pounds of medi- cal stores.	Miscellaneous.	Total number of pounds.
NOT OWNED OR RUN BY GOVERNMENT.													
Railroads.....	1,335	33,666	35,001	2,696	1,125	18	3,839	25,057,067	33,692,658	2,898,533	1,782,534	5,941,392	68,660,523
Steamboats, barges, &c.....	652	16,756	17,408	1,297	140	145	1,592	21,163,047	23,016,613	3,069,402	317,391	6,062,547	56,168,900
Stages.....	120	519	639	.....	.....	.....	.....	325,947	273,870	58,467	25,924	127,607	881,815
Wagons.....	66	3,219	3,287	49	85	.....	134	17,011,109	22,627,016	1,225,166	586,070	1,931,817	43,383,178
Total.....	2,175	54,160	56,335	4,042	1,350	163	5,555	63,627,170	79,610,157	7,239,867	4,713,869	13,903,353	169,094,416
OWNED OR RUN BY GOVERNMENT.													
Railroads.....	3,741	16,046	19,787	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Steamboats, barges, &c.....	3,741	16,046	19,787	21	144	150	315	1,228,703	1,270,005	32,269	35,771	149,348	2,716,096
Total.....	3,741	16,046	19,787	21	144	150	315	1,228,703	1,270,005	32,269	35,771	149,348	2,716,096
Grand total.....	5,916	70,206	76,122	4,063	1,494	313	5,870	64,855,873	80,880,162	7,272,136	4,749,640	14,052,701	171,810,513

Respectfully submitted.

M. I. LUDINGTON,
Quartermaster, U. S. A.

H.—*Statements of amounts paid on account of rail, river, stage, and wagon transportation by the Quartermaster's Department during the fiscal year ending June 30, 1871.*

Kind of transportation.	Passengers.	Total.	Freight.	Total.	Expenditures.	Grand total.
Railroad	\$250, 247 28	\$250, 247 28	\$225, 429 23	\$225, 429 23	\$2, 761 51	\$478, 438 02
Steamboat, barges, &c.	129, 361 14	129, 361 14	486, 425 23	486, 425 23	8, 269 22	624, 035 59
Stages	22, 978 46	22, 978 46	16, 167 44	16, 167 44	23 50	39, 169 40
Wagons, &c.	6, 306 73	6, 306 73	1, 304, 299 51	1, 304, 299 51	.....	1, 310, 606 24
	408, 893 61	408, 893 61	2, 032, 321 41	2, 032, 321 41	11, 054 23	2, 452, 269 25

Respectfully submitted.

M. I. LUDINGTON,
Quartermaster, U. S. A.

I.—*Statement of accounts and claims in the transportation division, Quartermaster General's Office, for the fiscal year ending June 30, 1871.*

	No.	Amount.	No.	Amount.
Number of accounts and claims on hand July 1, 1870.	1, 162	\$1, 244, 728 65		
Number of accounts received during the fiscal year.	171	802, 983 13		
Number of claims received during the fiscal year..	463	8, 394, 963 72		
Total number of accounts and claims on hand and received.	.....	.....	1, 796	\$10, 442, 675 50
Number of accounts referred for settlement during fiscal year.	522	1, 237, 034 14		
Number of claims referred for settlement during fiscal year.	810	509, 502 15		
Number of claims transferred to other branches...	28	7, 353 08		
Number of claims rejected during the fiscal year..	193	6, 860, 881 31		
Number of claims suspended at close of fiscal year.	10	5, 111 62		
Total number of accounts and claims referred, rejected, and suspended.	.....	.....	1, 563	8, 619, 883 30
Number of accounts awaiting action July 1, 1871.	.....	.....	41	115, 142 63
Number of claims awaiting action July 1, 1871.	.....	.....	192	1, 707, 650 57
Total number and amount.....	.....	.....	233	1, 822, 793 20

NOTE.—During the fiscal year ending June 30, 1871, the following claims of railroad companies (representing large amounts) were filed in this office, being in great part, for use of roads, rolling stock, services, &c., amounting in the aggregate to \$6,922,345 73, viz:

Nashville and Chattanooga, 2 claims, filed July 25, 1870, stated collectively at \$4,557,092 64. These claims were rejected by this office August 6, 1870.

Nashville and Northwestern, 1 claim, filed July 26, 1870, stated at \$848,140 69; rejected August 11, 1870.

East Tennessee and Virginia, 1 claim, filed June 29, 1871, amounting to \$751,200 07.

East Tennessee and Georgia, 1 claim, filed June 29, 1871, amounting to \$765,912 33.

The latter two claims were returned to the Treasury (recommending that they be rejected) July 18, 1871; they now necessarily appear in the claims "on hand," but will be placed among the rejections in the next fiscal year statement.

One claim for services of steamer John Farron, filed in this office November 11, 1870, and amounting to \$511,000 00, was also rejected, November 15, 1870.

It is to be remarked further, that in the column of claims "referred for payment," one claim of the Kentucky Central Railroad Company, amounting to \$148,553 82, was rejected by this office, but was subsequently allowed by the Secretary of War, and referred to the Auditor for settlement.

Respectfully submitted.

M. I. LUDINGTON,
Quartermaster, U. S. A.

K.—Statement of miscellaneous claims in the Quartermaster General's Office for the fiscal year ending June 30, 1871.

	No.	Amount.	No.	Amount.
On hand July 1, 1870, which had previously been suspended, or had received no decisive action.	13,794	\$7,031,340 88		
Claims previously rejected, which have been approved during the year.	407	142,176 12		
Received during the year.....	1,427	569,796 86		
Total number on hand and received.....			15,628	\$7,743,343 86
DECISIVE ACTION TAKEN DURING THE YEAR.				
Approved.....	846	229,693 54		
Reductions on claims approved.....		2,818 14		
Claims rejected, (filed during the year).....	197	53,546 36		
Total upon which action has been taken.....			1,043	286,060 04
Remaining on hand June 30, 1871.....			14,585	7,457,183 82

Respectfully submitted.

M. I. LUDINGTON, Quartermaster, U. S. A.

L.—Statement of claims filed under the act of July 4, 1864, chapter 240, in the Quartermaster General's Office, for the fiscal year ending June 30, 1871.

	No.	Amount.	No.	Amount.
On hand July 1, 1870, which had previously been suspended, or had received no decisive action.	9,683	\$4,953,256 52		
Claims previously rejected, which have been approved during the year.	473	176,082 03		
Received during the year.....	580	1,800,004 58		
Total number on hand and received.....			10,746	\$6,929,343 13
DECISIVE ACTION TAKEN DURING THE YEAR.				
Approved.....	580	202,298 74		
Reductions on claims approved.....		47,765 42		
Claims rejected, (filed during the year).....	60	132,148 17		
Total upon which action has been taken.....			580	382,212 33
Remaining on hand June 30, 1871.....			10,166	6,547,130 80

Respectfully submitted.

M. I. LUDINGTON, Quartermaster, U. S. A.

M.—General statement of claims and accounts in the division of Major M. I. Ludington, Quartermaster, United States Army, Quartermaster General's Office, for the fiscal year ending June 30, 1871.

	No.	Amount.	No.	Amount.
Transportation claims and accounts on hand June 30, 1870, and received during the fiscal year.	1,796	\$10,422,675 50		
Miscellaneous claims on hand June 30, 1870, and received during the fiscal year.	15,698	7,743,243 86		
Claims filed under the act of July 4, 1864, on hand June 30, 1870, and received during the fiscal year.	10,746	6,929,343 13		
Total on hand and received during the fiscal year.			28,170	\$25,095,263 49
Transportation claims and accounts disposed of during the fiscal year.	1,583	8,619,882 30		
Miscellaneous claims disposed of during the fiscal year.	1,043	286,060 04		
Claims filed under the act of July 4, 1864, disposed of during the fiscal year.	580	382,212 33		
Total disposed of.....			3,186	9,288,154 67
Total on hand June 30, 1871.....			24,984	15,807,107 82

Respectfully submitted.

M. I. LUDINGTON, Quartermaster, U. S. A.

N.—Miscellaneous claims filed in the Quartermaster General's Office since the commencement of the war.

Fiscal year filed.	APPROVED.		REDUCED.		REJECTED.		SUSPENDED.		NO DECISIVE ACTION.		TOTAL.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
1861-62.....	1,589	\$6,414,284 29		\$534,090 08	531	\$459,431 74	156	\$172,001 75	357	\$924,972 61	2,003	\$11,504,780 47
1862-63.....	2,373	3,555,840 31	45,360 73		2,347	563,814 10	449	137,491 70	527	691,694 62	5,596	5,001,131 46
1863-64.....	3,320	1,973,450 76	29,770 09		3,056	447,990 19	747	57,697 56	950	385,451 99	9,073	9,172,680 59
1864-65.....	8,574	2,023,427 20	62,387 79		3,160	714,262 78	1,219	163,196 69	2,062	796,054 94	15,035	3,765,339 39
1865-66.....	9,383	1,406,926 47	184,927 23		5,137	1,881,786 83	1,495	204,169 59	1,961	1,189,163 52	17,976	4,969,973 73
1866-67.....	3,509	560,240 83	162,998 62		2,618	711,350 09	653	133,310 18	1,314	659,857 16	8,194	2,227,756 88
1867-68.....	1,131	291,340 12	128,933 61		819	347,846 59	239	44,575 46	853	605,520 24	3,042	1,418,256 02
1868-69.....	757	251,055 09	72,394 16		576	219,358 97	121	262,803 26	240	385,892 61	1,694	1,171,444 09
1869-70.....	597	162,519 36	122,010 99		374	180,038 09	71	17,525 85	360	923,061 17	1,402	1,725,153 46
1870-71.....	439	87,517 42	2,818 14		197	53,546 36	101	40,436 06	690	385,404 88	1,437	569,736 86
Total.....	3,662	19,034,611 85	1,345,691 44		18,705	5,598,767 84	5,281	1,220,210 08	9,304	6,226,973 74	64,973	33,436,254 95

Respectfully submitted.

M. I. LUDINGTON, Quartermaster, U. S. A.

O.—Claims filed, under the act of July 4, 1864, chapter 240, in the Quartermaster General's Office.

Fiscal year filed.	APPROVED.		REDUCED.		REJECTED.		SUSPENDED.		NO DECISIVE ACTION.		TOTAL.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.
1864-65.....	783	\$273,860 80		\$56,736 17	1,404	\$1,023,420 87	246	\$169,515 79	357	\$164,324 62	2,800	\$1,687,959 25
1865-66.....	2,230	877,151 76	260,008 30		7,419	4,792,306 79	2,618	850,465 78	923	691,231 20	13,219	7,731,953 43
1866-67.....	1,197	248,640 84	363,470 61		3,102	1,634,068 61	2,082	832,853 09	697	477,669 29	7,068	2,077,963 94
1867-68.....	401	248,124 71	137,449 77		663	367,704 80	794	369,426 01	960	440,165 43	2,778	1,692,549 74
1868-69.....	173	106,406 78	47,645 51		222	142,006 45	167	61,472 46	265	313,011 68	847	1,676,549 82
1869-70.....	119	66,681 43	24,596 98		113	196,368 18	141	97,553 31	264	225,275 30	637	610,707 92
1870-71.....	47	26,216 71	47,765 42		60	132,146 17	83	921,747 91	400	1,572,126 57	580	1,800,004 56
Total.....	4,950	2,078,063 05	877,672 76		13,923	8,306,354 07	6,231	2,663,036 35	3,935	3,894,094 45	28,039	17,811,140 69

Respectfully submitted.

M. I. LUDINGTON, Quartermaster, U. S. A.

REPORT OF COMMISSARY GENERAL OF SUBSISTENCE.

REPORT

OF THE

COMMISSARY GENERAL OF SUBSISTENCE.

WAR DEPARTMENT,
OFFICE OF COMMISSARY GENERAL OF SUBSISTENCE,
Washington, October 17, 1871.

SIR: In compliance with the directions of the honorable Secretary of War, communicated to the Chiefs of Bureaus of the War Department in the circular from the Adjutant General's Office of September 9, 1871, I have the honor to submit this annual report of the operations of the Subsistence Department for the fiscal year terminating June 30, 1871.

No general or extensive changes in the distribution of the Army having taken place during the last fiscal year, the sources, purchase, and mode of distribution of subsistence stores, as indicated in my last annual report, remain substantially unchanged. I remark, in this connection, that I am more and more confirmed in my views—always approved by yourself—that it is best, on many accounts, to purchase subsistence stores for the troops from the producers and dealers at the several points of issue, when they can be so obtained of the proper quality, and at cost not in excess of the total cost when purchased in the large and more distant markets of the country and transported by the Quartermaster's Department.

But very few instances of complaint of the subsistence stores furnished the Army during the last year, either as to deficiency in quantity or inferiority of quality, have occurred, and those would not probably have been made except that it is the duty of inspectors general to observe, and report upon all supplies that do not attain a perfect standard.

It is believed that no army has ever been better supplied than the Army of the United States during the past year. For this result the credit is of course largely due to the officers of the Subsistence Department, who habitually give their personal attention to the quality and condition of their purchases as well as to the active and unremitting supervision of the assistant commissaries general and the commissaries acting as such, who, at the headquarters of military divisions and departments, supervise the affairs of the Subsistence Department within such divisions and departments.

While the regular Army ration is believed to be composed of the proper number and kinds of articles, and of very nearly the proper quantities of each, still I am of opinion that it should be provided in the contemplated regulations for the Army that, according to the varying hygienic necessities of the troops stationed in the widely diverse climates of the United States and Territories, there should be authorized and provided for issue, under proper medical advice and military orders, other or substitute articles, so that the food of the soldier may be occasionally varied from the regular ration. This is now effected, to a considerable degree, by the sale of any savings of their rations made by

soldiers, and the use of the proceeds of such sales in the purchase of vegetables or other articles of food. This mode of varying the food of troops is readily practicable when they are stationed in the settled parts of the country, but on the distant frontiers and at places where gardening is impracticable the provision recommended becomes necessary. I have made suggestions accordingly in the regulations sent in from this Bureau for the consideration of the Secretary of War.

One of the colonels and the two lieutenant colonels, assistant commissaries general, and one of the senior majors, acting as such, are stationed at the headquarters of the Divisions of the Atlantic, the Pacific, the Missouri, and the South, viz, Philadelphia, San Francisco, Chicago, and Louisville, and have general charge of the affairs of the Subsistence Department within their respective divisions. Nine of the commissaries of the rank of major and captain are stationed at the headquarters of the Military Departments of the East, the South, the Missouri, the Lakes, California, the Platte, the Columbia, Dakota, and Texas, acting as assistant commissaries general of such military departments, and usually also performing the duties of purchasing and depot commissaries. The remaining officers of this Department are stationed at important points of purchase or at depots, as New Orleans, Chicago, Washington, Sioux City, Baltimore, Denver, St. Louis, Santa Fé, and Fort Union, or are on duty in this Bureau; every officer of the Department being on duty.

During the fiscal year ending June 30, 1871, there were reported to this office 249 advertisements inviting proposals for furnishing supplies; 265 contracts for fresh beef and beef-cattle; 70 contracts for complete rations; 101 contracts for miscellaneous articles; and 576 contracts consisting of written proposals and acceptances.

The average price of fresh beef, per contracts made during the year, was as follows in the several States and Territories:

State or Territory.	Cents per pound.	State or Territory.	Cents per pound.	State or Territory.	Cents per pound.
Maine	13.08	Alabama	8.75	Indian Territory	8.51
Massachusetts	13.50	Mississippi	10.42	Dakota Territory	9.45
Rhode Island	14.50	Louisiana	7.58	Wyoming Territory	9.45
Connecticut	14.50	Texas	4.25	New Mexico Territory	9.33
New York	12.27	Tennessee	9.29	Colorado Territory	12.65
Pennsylvania	13.77	Kentucky	10.07	Utah Territory	12.15
Delaware	16.00	Ohio	11.00	Montana Territory	12.92
Maryland	12.35	Indiana	9.50	California	9.60
District of Columbia	11.88	Illinois	8.87	Oregon	9.71
Virginia	14.87	Michigan	10.85	Arizona Territory	12.43
North Carolina	14.12	Missouri	8.28	Washington Territory	10.37
South Carolina	10.00	Minnesota	10.52	Idaho Territory	15.04
Georgia	10.00	Nebraska	9.10	Nevada	14.16
Florida	9.20	Kansas	11.11		

Giving an average contract price of 11.09 cents per pound net for the year.

The first cost of the regular Army ration at the principal points of purchase, has been as follows:

Date.	New York, N. Y.	Baltimore, Md.	Louisville, Ky.	St. Louis, Mo.	St. Paul, Minn.	Omaha, Nebr.	Fort Leavenworth, Kans.	New Orleans, La.	Chicago, Ill.	San Francisco, Cal.
1870.	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>	<i>Cents.</i>
July.....	20.81	22.29	20.29	22.35	18.65	20.18	17.81	22.03	20.26	22.65
August.....	22.31	24.98	19.71	22.03	20.16	20.54	19.60	21.20	21.35	22.39
September.....	21.40	22.30	19.49	19.23	19.72	21.52	19.27	21.04	23.27	22.17
October.....	20.16	22.38	20.14	22.61	19.86	19.85	19.87	20.81	20.51	21.97
November.....	20.73	20.77	20.12	18.72	19.21	20.07	18.50	20.64	20.50	21.40
December.....	18.96	22.50	19.15	22.82	17.35	20.06	20.45	19.17	17.11	21.38
1871.										
January.....	18.68	19.83	18.48	16.61	17.45	19.22	18.94	20.93	15.68	21.78
February.....	19.16	22.90	19.29	18.88	17.23	17.63	18.85	20.01	18.23	21.70
March.....	17.70	18.39	19.36	18.85	17.68	17.43	18.42	19.28	18.23	22.02
April.....	17.62	19.11	19.11	18.67	17.43	17.23	17.57	18.47	16.02	22.03
May.....	16.05	17.91	18.40	18.21	17.03	17.20	18.11	18.27	17.20	22.77
June.....	15.48	17.64	17.92	17.11	17.36	17.49	16.79	17.66	17.04	20.89
Average.....	19.06	20.91	19.20	19.67	18.26	19.03	18.76	19.96	18.78	21.92

Giving, as the general average, nineteen cents and fifty-six hundredths per ration, being a decrease of one cent and ninety-seven hundredths from the price of the previous year.

Under the requirements of section 6 of the act of March 3, 1865, and of War Department General Orders No. 52, of March 30, 1865, tobacco has been furnished to the enlisted men of the Army at cost prices; the total cost of the quantity sold to them being about \$16,242 per month for the year.

From the date at which the Subsistence Department commenced furnishing tobacco for sale to the enlisted men of the Army, in 1866, to June 30, 1871, the amount furnished, as shown by the returns transmitted by this Bureau to the Paymaster General, has been, in money value, \$921,859 67. Of this sum there appears to have been repaid to the subsistence appropriations by transfers at the Treasury, from the amounts withheld by the Pay Department from the pay of the individual soldiers to whom the tobacco was furnished, the sum of \$755,316 65, leaving still due the subsistence appropriation on this account the sum of \$166,543 02, which sum will be repaid by further transfers when the accounts of the various paymasters making the stoppages shall be adjusted.

The hospitals of the Bureau of Freedmen, Refugees, &c., have during the year been furnished on the requisitions of the Commissioner or his agents with subsistence stores to the value of \$37,605 27. Of this, the sum of \$2,898 76 has been transferred at the Treasury to the appropriation for Army subsistence, leaving a balance of \$34,706 51 for future transfer.

Under the provisions of section 16, act of June 30, 1834, and paragraph 1202 Revised Regulations for the Army, 1863, subsistence stores, valued at \$85,337 04, have been issued to Indians of the various tribes visiting the military posts on the frontier or in their respective nations.

Issues have also been made to Indians under proper instructions, and to meet special emergencies, as follows :

At Fort Defiance, New Mexico, valued at.....	\$41,744 49
At Livingston, Texas, valued at.....	813 29
At Fort Stevenson, Dakota Territory, valued at.....	5,461 58
At Cheyenne agency, Dakota Territory, valued at.....	115 00
At Forts Laramie and Fetterman, Washington Territory, valued at.....	150,261 16
At Fort Rice, Dakota Territory, valued at.....	5,105 51
At Fort Buford, Dakota Territory, valued at.....	3 44
At Fort Shaw, Montana Territory, valued at.....	73 60

Making 203,578 27

Of which amount the following has been refunded to the appropriations for Army subsistence :

For issues at Cheyenne agency, Dakota Territory	\$115 00
For issues at Livingston, Texas	813 29
For issues at Fort Stevenson, Dakota Territory	5,093 33
	<u>6,021 62</u>

Since my last annual report there has been furnished the Department of the Interior a detailed statement of the expenses incurred in the fiscal year 1869-70, by the Subsistence Department, in furnishing the Indian Department with supplies for the Indians at Fort Sill and Camp Supply, Indian Territory, and at Cheyenne, Whetstone, Grand River, Yankton, and Crow Creek agencies, and other points on the Upper Missouri River, which expenses were to be repaid to the subsistence appropriation from the appropriation of \$2,000,000, made by section 4 of the act of April 10, 1869. That statement shows the amount to have been \$1,647,243 82, of which \$1,200,000 has been repaid by transfer at the Treasury, leaving a balance due the subsistence appropriation of \$447,243 82.

Under the third section of the act approved July 4, 1864, requiring the Commissary General of Subsistence to cause claims for subsistence supplies furnished for the Army during the war in the States not in rebellion, and subsequently extended to include claims from the State of Tennessee, and the counties of Berkeley and Jefferson, West Virginia, there have been received, up to the 30th day of September last, 5,747 claims, amounting to the sum of \$3,115,570 35.

Ninety-six of these claims, amounting to \$8,066 42, accompanied by regular vouchers given by the officer at the time of purchasing the stores, have been recommended for payment by the Third Auditor as purchases under contract; and 1,197 of them for \$371,822 have been examined and recommended for payment under this act in the sum of \$270,214 29; and 4,330 of them, aggregating \$2,617,322 95, have been examined and disallowed.

It has been the practice of this office to allow the reopening of disallowed claims under this act upon the presentation of additional evidence on the part of the claimant, but hereafter this practice will be restricted to those cases, if any, in which the new evidence (except in correction of reports made to this office) shall be material, and it shall fully appear that it was not known to, or was not attainable by, the claimants prior to the first decision in their cases.

The act of Congress approved March 3, 1871, making appropriations for the support of the Army for the year ending June 30, 1872, and for other purposes, by which the President was authorized to appoint a board of commissioners to receive, examine, and consider the validity and justice of the claims of citizens who remained loyal to the Govern-

ment of the United States during the rebellion, for stores or supplies taken or furnished during the rebellion for the use of the Army in States proclaimed as in insurrection, the Attorney General held, in his opinion dated April 6, 1871, terminated the authority of this office to examine claims from Tennessee, Berkeley and Jefferson Counties, West Virginia, under the act of July 4, 1864. But by section 27 of the act approved April 20, 1871, making appropriations to supply deficiencies, and for other purposes, Congress declared that the jurisdiction extending the act of July 4, 1864, to claims from Tennessee, and the counties of Berkeley and Jefferson, should not be withdrawn or impaired by any construction of the law creating commissioners of claims, and that the jurisdiction upon all claims presented to the proper Department by loyal citizens from Tennessee and the two counties named, before the 3d of March, 1871, should remain as before the passage of the act creating the commission of claims.

Claims from Tennessee and the said Berkeley and Jefferson Counties are, therefore, if filed under the act of July 4, 1864, prior to March 3, 1871, still acted upon, but if presented subsequent to that date are held without action for want of jurisdiction; for Congress by express declaration having continued action upon all the claims in question filed prior to March 3, 1871, by necessary implication withholds jurisdiction upon all such claims presented subsequent to that date.

The payment of commutation of rations to Union soldiers, prisoners of war, and to their heirs, has been continued under the joint resolution of July 25, 1866, and section 3, act of March 2, 1867, and 6,335 such certificates, aggregating \$279,769, have now been received and paid.

During the year there were received, from 614 different officers of the Army who have been on duty in the Subsistence Department, and who were responsible for subsistence supplies or funds, the following monthly and quarterly papers, each with its proper vouchers:

Returns of provisions	3, 150
Returns of commissary property	1 484
Accounts current	3, 434

Making a total of	8, 068
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of which 7,805 have been examined and forwarded to the Third Auditor of the Treasury for final settlement, leaving in this office for examination, or awaiting correction, 363.

Under the act of June 23, 1870, authorizing the proper accounting officers of the Treasury, in the settlement of certain accounts of disbursing officers at the War and Navy Departments, to allow such credits for overpayments and for losses of funds, vouchers, and property, as they may deem just and reasonable, when recommended under authority of the Secretaries of War and Navy, by the heads of the military and naval Bureaus to which such accounts respectively pertain, credits have, during the past fiscal year, been recommended by me in the cases of forty officers, amounting in the aggregate to the sum of \$18,131 30. Fully three-fourths of this amount arose from errors due to the inexperience of the officers, or the exigencies of active service in the field. The officers were mostly those who served during the war, and who have retired to civil life.

I have the honor to be, very respectfully, your obedient servant,

A. B. EATON,

Commissary General Subsistence.

Hon. WM. W. BELKNAP,
Secretary of War.

REPORT OF THE SURGEON GENERAL.

REPORT

OF

THE SURGEON GENERAL.

WAR DEPARTMENT, SURGEON GENERAL'S OFFICE,
Washington, D. C., October 5, 1871.

SIR: I have the honor to submit the following statement of finances and general transactions of the Medical Department of the Army for the fiscal year ending June 30, 1871:

FINANCIAL STATEMENT.

The funds of the Medical Department for the year ending June 30, 1871, consisted of—

Balance in the Treasury, July 1, 1870	\$1,388,634 99
Balance in the hands of disbursing officers	218,429 23
Appropriation for the medical museum and library by act of July 15, 1870	8,000 00
Deficiency appropriation by act of March 3, 1871	100,000 00
Proceeds of sales	177,830 30
Amount received for board in hospitals	6,140 46
Amount recovered for property lost or damaged	20 66
Derived from all other sources	114 10
	1,899,169 74

The disbursements were—

I. In payment of claims and fulfilling contracts prior to July 1, 1870:		
For medical and hospital supplies	\$41,248 37	
For medical and other services	6,970 52	
For expenses of depots	339 20	
For artificial limbs	5,334 00	
For care of soldiers in private hospitals	622 25	
Salvage paid on vessel carrying medical supplies	10,750 72	
Internal revenue	243 82	
	\$65,508 88	

II. Current expenses of the year:*		
For medical and hospital supplies	200,571 67	
For medical and other services	15,099 17	
For expenses of depots	37,925 65	
For office and incidental expenses of the Medical Department	5,593 42	
For medical museum and library	8,000 00	
For care of soldiers in private hospitals	287 17	
	267,477 08	
Balance in the Treasury, June 30, 1871	1,422,082 91	
Balance in the hands of disbursing officers	144,100 87	
	1,566,183 78	
	1,899,169 74	

* Medical and hospital supplies to the amount of about \$30,000 were contracted for but not received and paid for before the close of the fiscal year, and thus remained a charge against the unexpended balance; making the entire expenses of the year \$297,477 08.

In addition to the above there remained on July 1, 1870, of the sum of \$750,000, appropriated by act of March 3, 1869, to enable the Secretary of the Treasury to settle the accounts of disbursing officers.....

\$150,920 70

Transferred during the year..... \$70,669 55
Balance remaining June 30, 1871..... 80,251 15

\$150,920 70

Of the appropriation by act of July 5, 1862, for the comfort of sick and discharged soldiers, there remained, July 1, 1870.....

\$315,364 07

Expended during the year:

For treatment and care in hospitals, and for surgical appliances.....

\$8,165 66

For transporting destitute soldiers to their homes.....

7,395 64

\$15,561 30

Balance, June 30, 1871.....

299,802 77

Total.....

315,364 07

ARTIFICIAL LIMBS.

Congress having, by acts approved June 17 and 30, 1870, provided for a reissue of artificial limbs to persons disabled in the military or naval service of the United States, leaving it optional with each to receive a limb in kind or a stated commutation in money, the number who availed themselves of these acts, up to June 30, 1871, was 8,918.

These received—	In kind.	Commutation.
Arms.....	104	4,067
Legs.....	1,117	3,114
Feet.....	5	51
Apparatus for resection.....	22	538

The number of persons furnished with limbs under the acts previous to June 17, 1870, was 7,887, of whom 1,367 have not applied under the present law, and may, with few exceptions, be presumed to be dead. It thus appears that 2,398 have been admitted under the acts of June, 1870, who had not applied under the previous laws, doubtless for the reason that their injuries were of such a nature that they could not wear artificial limbs with advantage.

HEALTH OF THE ARMY DURING THE YEAR.

The monthly reports of sick and wounded received at this office for the fiscal year terminating June 30, 1871, represent an annual average mean strength of 29,365 *white*, and 2,608 *colored* troops.

Among the *white* troops, the total number of cases of all kinds reported as taken on the sick list was 63,507, being at the rate of 2,163 per 1,000 of mean strength. (That is about two entries on sick report during the year for each man.) Of the whole number taken on sick report 54,710, or 1,863 per 1,000 of strength were for disease alone, and 8,797, or 300 per 1,000 of strength were wounds, accidents, and injuries of all kinds.

The average number constantly on sick report during the year was 1,480, or 51 per 1,000 of strength; of these 1,190, or 41 per 1,000 of strength were under treatment for disease, and 290, or 10 per 1,000 of strength for wounds, accidents, and injuries.

The total number of deaths reported was 519, or 17 per 1,000 of mean strength. Of these 363, or 12 per 1,000 of strength, died of disease, and 156, or 5 per 1,000 of strength, of wounds, accidents, and injuries.

The total mortality rate is greater than that for the previous year, the chief increase occurring in the proportion of deaths from disease. The proportion of deaths from all cases treated was 1 death to 122 cases.

One thousand and ninety-one *white* soldiers are reported to have been discharged on "surgeon's certificate of disability," being at the rate of 37 per 1,000 of mean strength.

The reports from the *colored* troops give the following figures, which do not include the white officers:

The total number of cases of all kinds reported was 3,551, or 1,362 per 1,000 of strength. Of these 2,964, or 1,137 per 1,000 of strength, were cases of disease, and 587, or 225 per 1,000 of strength, were wounds, accidents, and injuries.

The average number constantly on sick-report was 104, or 40 per 1,000, of whom 74, or 28 per 1,000, were under treatment for disease, and 30, or 12 per 1,000, for wounds, accidents, and injuries.

The number of deaths from all causes reported was 49, or 19 per 1,000 of strength. Of these 28, or 11 per 1,000 of strength, died of disease, and 21, or 8 per 1,000 of strength, of wounds, accidents, and injuries. The proportion of deaths from all causes to cases treated was 1 to 72.

The number of discharges on "surgeon's certificate of disability" was 71, being at the rate of 27 per 1,000 of mean strength.

WORK PERFORMED IN THE RECORD AND PENSION DIVISION.

The official demands for information from the files of record and pension division have diminished but little during the year. As heretofore, the inquiries refer chiefly to the cause of death, or discharge from service, and the hospital history of soldiers dead or disabled during the war of the rebellion. The books of the closed general hospitals and other records on file give the information sought in the majority of instances; but a tedious search is often required, particularly when the inquiry refers to the hospital history of a soldier who has been transferred from hospital to hospital during the progress of his treatment. Cases of this class have formed recently a large proportion of the inquiries, making the labor of reply great, while, as the information is needed for the settlement of pension and other claims, the utmost accuracy is required in each case to protect the interests of the Government as well as to do justice to the applicant.

At the commencement of the fiscal year 3,440 such applications were awaiting reply, and 19,844 new applications were received during the year, making a total of 23,284 applications to be searched and replied to.

Owing to the inadequate clerical force, search could not be made and replies furnished in all of these cases, although 14,040 were acted upon, leaving 9,244 unanswered at the close of the fiscal year. This has now, however, been remedied by the increase recently authorized by the Honorable Secretary of War, and it is hoped that within a year all this accumulated business will be disposed of, and that it will be possible thereafter to furnish the desired information with reasonable dispatch.

WORK PERFORMED IN THE DIVISION OF SURGICAL RECORDS.

There were entered on the registers the histories of 5,210 surgical cases of the late war, making a total of 235,398 now recorded; also

additional information respecting 9,661 cases already recorded, and prepared for revision abstracts of 8,947 cases which were not placed on the permanent registers. The hospital record of 22,756 men was searched; 16,008 names were indexed. The pension medical examiners' reports of the condition, at the latest dates, of mutilated men, were transcribed in 2,564 instances. Histories of surgical cases were furnished to other departments of the Government in sixty-five instances.

ARMY MEDICAL MUSEUM.

The Army medical museum continues to increase in the number and variety of specimens and its consequent usefulness. The number of specimens added during the year was 1,516, a present total of 15,018. The number of visitors was over 15,000 during the year.

MEDICAL AND SURGICAL HISTORY OF THE WAR, ETC.

Part first of the Medical and Surgical History of the War is near completion, and will be laid before Congress during its coming session, when it is hoped sufficient appropriation will be made to continue the publication of the remaining parts. Circular No. 4, a report upon barracks and hospitals, with a description of military posts throughout the United States, compiled by Assistant Surgeon J. S. Billings, United States Army; Circular No. 3, 1870, approved plans and specifications for post hospitals—also, a revised edition of the same, (Circular No. 2, 1871)—have been published during the year, and the standard supply table of the Medical Department of the Army, (Circular No. 1, 1871,) has been carefully revised and published with a view to more rigid responsibility and greater efficiency.

NUMBER OF MEDICAL OFFICERS, ETC.

At the date of my last annual report two vacancies in the grade of surgeon and forty-two in assistant surgeon of the Army existed. During the past year one surgeon and one assistant surgeon have died, one assistant surgeon retired, and one assistant surgeon cashiered, leaving at present fifty-four vacancies in the corps, viz, chief medical purveyor, one assistant medical purveyor, three surgeons, and forty-nine assistant surgeons. The number of military posts requiring medical attendance was, on July 1, 1871, 206, at many of which the number of troops was so large, or the nature of the duties so onerous, that the services of two medical officers were constantly required at them. If the restrictions as to promotions and appointments in the medical corps were removed at once, it would require several years, through the prescribed modes of annual examination, to restore it to the standard number allowed by existing laws, and the reduction of that number, by stoppage of promotion and appointments, has proved to be prejudicial to the interests of the service, both in a sanitary and economical view.

J. K. BARNES,

Surgeon General, United States Army.

The Honorable the SECRETARY OF WAR.

REPORT OF THE PAYMASTER GENERAL.

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REPORT

OF

THE PAYMASTER GENERAL.

PAYMASTER GENERAL'S OFFICE,
Washington, October 9, 1871.

SIR: I have the honor to submit my annual report of the transactions of the Pay Department of the Army for the fiscal year ending June 30, 1871.

Tabular statements accompanying show in detail the fiscal operations of the Department for that year, summarily stated as follows:

Balance on hand at the beginning of the fiscal year, (July 1, 1870)....	\$3,379,683 41
Received during the fiscal year from the Treasury	17,738,000 00
Received from other sources	161,552 95
Total	21,279,236 36

Disbursed to the Army, including the Military Academy	\$15,830,901 43
Disbursed to volunteers, (back pay and bounty).....	2,683,172 44
Total disbursements	18,514,073 87
Refunded to Treasury	60,938 63
Balance in hands of paymasters to be accounted for in next report.....	2,704,223 86

Total	\$21,279,236 36
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RECEIPTS AND DISBURSEMENTS ON ACCOUNT OF RECONSTRUCTION FUND FOR FISCAL YEAR ENDING JUNE 30, 1871.

Balance in hands of paymasters, June 30, 1870.....	\$277,813 21
Received from sundry sources.....	110 00
Total	277,923 21

Accounted for as follows:	
Expenses of reconstruction paid.....	\$155,990 58
Internal revenue tax	2,190 26
Total disbursements	158,180 84
Refunded to Treasury	119,018 85
Balance in hands of paymasters, June 30, 1871.....	723 52

Total	277,923 21
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The Army has been fully paid, and all other requirements of the Department have been faithfully executed.

PAYMASTERS.

The number (sixty) of paymasters allowed by the law of July 28, 1866, is now reduced by casualties to fifty-one. Though the strength of the

Army has, in pursuance of law, been materially reduced during the past year, that circumstance does not admit of a proportional reduction of the number of paymasters, because there is not yet, nor is it probable there will be, a material diminution of the number of garrisoned posts. As urged in my last annual report, it is the multitude of widely scattered small detachments covering the face of the continent, largely in the unsettled Indian districts, that creates the necessity for so large a force of paymasters, and gives unceasing employment on the frontier to the greater portion of them.

RECONSTRUCTION.

The receipts and disbursements on account of reconstruction during the fiscal year are exhibited summarily in the statement at the beginning of this report. The officers of this Department continued to make the disbursements until all the States were admitted to representation in Congress, and all the approved claims presented had been paid, when the unexpended balances of the appropriation remaining were refunded to the Treasury, remitting to the accounting officers the adjustment of any possible claims in that behalf yet unsettled.

PAYMASTERS' DRAFTS.

It becomes my duty to suggest, as of eminent importance to the service and to the public, that Congress be asked to authorize the issue and direct the payment in all cases of duplicate checks to supply lost original checks, issued upon satisfactory proof of such loss and under regulations to be prescribed by the Secretary of the Treasury. Such issue of duplicate checks by paymasters is now virtually prohibited except in a single class of cases, namely, those in payment of additional bounties. That virtual prohibition results from the construction of the Treasury Department, announced in a circular of the Second Comptroller dated May, 15, 1871, which I here quote entire that the subject may be the better understood :

SIR: In the act entitled "An act to facilitate the payment of soldiers' bounties under act of 1866," approved March 19, 1868, it is provided (section 3,) that the assistant treasurers of the United States in the cities of New York and San Francisco be, and they are hereby, directed to pay duplicate checks for bounties granted under the said act upon notice and proof of the loss of the original check or checks under such regulations as the Secretary of the Treasury may direct.

On the 15th of May, 1868, the Secretary issued instructions regulating the issue and payment of duplicates of checks issued in payment of bounty under the act of July 28, 1866, as provided in that act.

It will be observed that the above act and instructions apply *only* to checks issued in payment of additional bounty; but as the plan adopted was considered to be a safe one so far as the Government is concerned, and in many cases a great convenience to claimants, it has been extended to cases of lost checks *other* than those issued in payment of said bounty.

At the last session of Congress a bill was introduced providing a general system for the issue and payment of duplicates of lost checks drawn by disbursing officers of the United States, under such rules and regulations as should be prescribed by the Secretary of the Treasury.

This bill Congress declined to pass in the form presented, but modified it so as to apply only to checks issued in payment of pensions where the amounts do not exceed \$500.

As this matter has been brought to the attention of Congress, and as they have refused to authorize the issue and payment of duplicates of lost checks except in cases where the originals were issued in payment of additional bounty or pensions, this office will conform to what appears to be the legislative intent, and will hereafter decline to approve any duplicate check, except for additional bounty and pensions as specially authorized by law.

Now inasmuch as paymasters in the execution of their duties are called upon to issue checks for various other purposes than additional bounties—indeed are required by law to make all their payments by means of checks or drafts so far as the circumstances will permit that mode of payment—all such issues are, equally with bounty checks, of importance to the public service and entitled to the like protection.

Of these general checks are those transmitted to discharged soldiers, and the heirs of deceased soldiers, in payment of Treasury certificates, issued for back-pay and ordinary bounties, (not the *additional* under law of July 28, 1866.) Also, those issued in large numbers to officers and soldiers in the field and at remote stations for remittance to their families and friends, where no other possible means of remitting money is available to them except the very hazardous one of committing to the mails *money in kind*, which will rarely be ventured.

In the commercial world checks, drafts, or bills, payable to order, are considered absolutely the safe form of making remittances of money, because if lost in their transit a practicable process is always available for their renewal or duplication. What consideration of policy or of the public interest should make the Government draft a less safe or convenient medium of remittance is not comprehended.

Respectfully submitted.

B. W. BRICE,

Paymaster General, U. S. A.

The Honorable the SECRETARY OF WAR.

REPORT OF THE CHIEF OF ORDNANCE.

REPORT OF THE CHIEF OF ORDNANCE.

WAR DEPARTMENT,
Ordnance Office, October 24, 1871.

SIR: I have the honor to submit the following report of the principal operations of the Ordnance Department during the fiscal year ended June 30, 1871, with such remarks and recommendations as the interests of that branch of the military service seem to require.

The fiscal resources and disbursements of the Department during the year were as follows, viz:

Amount of appropriations in Treasury June 30, 1870	\$14,499,779 70
Amount in Government depositories, to credit of disbursing officers, on same date.....	377,754 87
Amount of deposits in Treasury not reported to the credit of the appropriations on the same date.....	99,367 76
Amount of appropriations from July 1, 1870, to June 30, 1871, including the fixed annual appropriations for arming and equipping the militia.....	762,912 55
Amount received since June 30, 1870, on account of damages to arms in hands of troops, from sales of arms to officers, and condemned stores, and from all other sources not before mentioned.....	9,960,895 97
Total	25,700,710 85
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Amount of expenditures since June 30, 1870.....	*\$1,644,050 43
Amount of expenditures attending auction sales of ordnance stores since June 30, 1870, preparing them for sale and transporting them to place of sale	239,030 90
Amount of deposits in Treasury not reported to the credit of the appropriations.....	706,537 83
Amount in Government depositories to credit of disbursing officers on June 30, 1871	346,796 52
Amount of appropriations in Treasury on same date	†22,764,295 17
Total	25,700,710 85

During the last fiscal year there existed a great demand in Europe for small-arms and other ordnance stores, and this Department took advantage of it and sold, at fair prices, about ten millions of dollars' worth of small-arms and other ordnance stores, under authority given by Congress in July, 1868. The proceeds of the sales, except a small sum which is retained to meet expenses incurred in preparing other stores for sale, have passed from the control of this Department and into the Treasury.

* Of this sum over \$340,000 is for arms and ammunition made for the Navy Department, and \$31,610 60 for settlement of war claims.

† Of this sum only \$893,534 59 (under the appropriation for arming and equipping the militia) is now available, the balance having, under the act of July 12, 1870, passed from the control of this Department for current expenditures.

The operations at the arsenals have been confined chiefly to the manufacture of such supplies as were required for issue to the troops; to the manufacture of a small extra supply of cartridges for small-arms; to the care and preservation of the large quantities of ordnance stores which are on hand, and which require frequent overhauling and cleaning; and to the manufacture of one or two experimental gun-carriages.

The construction of the Rock Island Arsenal has been carried on as rapidly as the liberal appropriations made by Congress would allow. Two of the workshops are nearly completed, and will very shortly be occupied, one as a store-house, and the other in place of the temporary workshops which are to be removed. The act of Congress of April, 1864, authorized and empowered the Secretary of War to take possession of the whole of the island of Rock Island, and directed him to build thereon and maintain an arsenal for the construction, deposit, and repair of arms and munitions of war. It seems manifest that Congress intended that this arsenal should be made the great arsenal of deposit and construction for the Mississippi Valley, and that it should possess the manufacturing capacities of the national armory at Springfield, Massachusetts, and of one of our largest arsenals of construction, and it was planned with that end in view, and has been so built. Its location is most admirable, and its importance and value to the Government, especially in time of war, will be very great, almost incalculably so. A recent inspection of this arsenal has shown me that the work is being economically, rapidly, and well done. I hope that the appropriations asked for the next fiscal year will be granted by Congress.

The operations at the Springfield Armory have been confined chiefly to the conversion of a small number of Springfield rifle-muskets into breech-loaders for issue to troops, and to the States and colleges; to the manufacture of 22,000 Remington rifles for the Navy Department; and three or four kinds of experimental muskets and carbines, for comparative trial by troops in the field. Three of these systems have been put into the hands of the troops, and monthly reports are made to this Bureau upon them, as was directed by you on my indorsement of July 8, 1870, submitting the report of the board of officers of June 10, 1870, of which Major General Schofield was president.

It is expected that sufficient information in regard to these experimental arms will be derived from troops using them to warrant the appointment—some time next summer—of the board which is to select and recommend to the War Department a breech-loading system for adoption for the military service. It is highly important that this board shall act as soon as possible upon the subject, and that a breech-loading system shall be adopted as soon as possible, and adhered to until a large number of breech-loaders can be made for the Government. Now there are less than 10,000 breech-loading muskets in the arsenals for issue. This number of muskets is not half sufficient to supply the States with the muskets they are now entitled to receive under their appropriation of the permanent appropriation for arming and equipping the militia. It is important that the arms of the States should be like those used by the Government, and I believe the States are anxious to get the same kinds of arms. For these reasons I have been anxious to furnish them, to the extent of the ability of the Department and of their credits, with arms like those our troops are armed with, and I have not been willing to encourage any State in getting any other arms. This Department should, as soon as possible, be placed in a condition to fill all proper requisitions by the States upon it, and should also have on hand in store a large number of breech-loading muskets and carbines to meet

any emergency that may arise. Ten years ago the country felt that not less than a million of muskets should be kept in store in the arsenals. We are making very few arms at present, and for the reason that no breech-loading arm has yet been adopted for our military service.

The conflicting interests of inventors and holders of patents on breech-loading small-arms have seriously embarrassed this Department in the selection of a system for adoption. It appears there are patents (one or more) upon all breech-loading small-arms, and it is not thought that any gun has been made, or can be made by the Government, upon which a claim for royalty will not be made against this Department. I have declined to give an opinion upon the validity of any patent which the Government may have used, or to recommend the allowance of royalty by the War Department on any small-arms which have been made by the Government; and I shall continue to do so, believing that the amount of compensation, and the persons who may be entitled to receive it, should be determined elsewhere than in the War Department.

In my annual report for 1869, I said :

The chief difficulties which this Department had to contend against in producing a good breech-loading musket, have arisen from the impossibility of making any improvement which is not immediately claimed under some one of the many patents which have been granted for improvements in fire-arms, and from the extreme eagerness and strong efforts of some inventors, and all other parties interested in patents, to have their improvements used by the Government. Many persons claim to hold patents for improvements which are used in the conversion of the Springfield muskets; in some instances several parties have claimed to hold patents for the same thing, and it is believed that every improvement is claimed by more than one inventor. The Bureau has declined to acknowledge the validity of any patents for improvements used in the conversion of the Springfield rifled musket, knowing that it was not competent for it to decide the question, and believing that the proper course for patentees to take was to establish satisfactorily the validity of their claims, and then apply to Congress for compensation for the use of the patents.

These difficulties have continued to embarrass this Department, and to affect injuriously the interests of the Government; and it is respectfully suggested whether a law may not be devised, which, while affording protection to all inventors in the rights secured to them by patents, will enable the Government to use unrestrictedly any improvement which it may be desirable for it to use. I have no desire to see any inventor deprived of any of his rights, without just compensation; but I am so fully convinced that some law protecting the Government against improper claims of inventors and owners of patents should be passed, that I feel it my duty to bring the matter particularly to your notice, in the hope that something may be done to secure so desirable an end. Such a law would relieve this Department of much annoyance and embarrassment, and would tend, in my opinion, to increase to a considerable degree the efficiency of the public service.

It is respectfully suggested that a law be passed which will authorize officers in charge of public works to make use of all inventions, or improvements whatever, applicable to the work under their charge; and which will provide that when a claim for damages is made by any person for an invention or improvement so used, at least — days' notice shall be given, requiring all parties claiming said invention or improvement to present their claims, with the evidence in support of the same, to some special tribunal authorized to try the same, whose duty it shall be to decide who is the party entitled to damages or remuneration, and to fix the amount which should be paid by the United States for the use of the invention or improvement; their decision to be final, so far as the United States are concerned; and the amount declared to be due from the United States to be paid out of the appropriation for which the work done is paid.

I repeat this, and earnestly ask that such legislation may be requested of Congress as may be necessary to secure the rights of inventors and owners of patents, and to protect those of the Government and its agents. These latter are not protected now. The commanding officer of Springfield Armory and myself have, for more than a year, been subjected to the annoyance of a suit brought against us personally for our official action

in having arms made at Springfield Armory under the orders of the Secretary of War, and the Government has at the same time been compelled to submit to an expensive lawsuit brought to restrain it from making the arms. Such a state of things ought not to exist.

A small number of revolvers (pistols) which use the primed metallic cartridge, have been made and issued to troops, and the few reports upon them which have been received at this Bureau show that they are greatly superior to the revolvers which use the paper cartridges, and must supersede them in the service. As soon as a proper model can be selected it should be adopted, and steps should be taken to make at the National Armory all of them which the Government may require. It will be more economical for the Government to pay a fair royalty and manufacture the revolvers, than to purchase them from the manufacturer, who will charge both royalty and manufacturer's profit.

Benicia Arsenal has been for some years the principal and almost the only arsenal on the Pacific coast. A recent inspection has shown me that it should be made capable of doing all the necessary repairs of ordnance stores for the Pacific coast. The cost of transferring stores from the Pacific coast to arsenals on the Atlantic is so great that no stores should be sent east for repairs. My estimates for Benicia Arsenal have been made with a view to making it of sufficient capacity to do all the repairs of stores for the Pacific coast.

Since the date of my last report St. Louis Arsenal has been turned over to the Quartermaster's Department and converted into a cavalry recruiting depot; and Jefferson Barracks has, under your orders, been occupied as an arsenal. The transfer of the ordnance and ordnance stores from the arsenal to the barracks has been nearly completed. Jefferson Barracks is an excellent site for an arsenal, and its storehouses are capacious and in good order. Baton Rouge Arsenal has also, in pursuance of orders, been turned over to the Quartermaster's Department for garrison purposes, and was finally closed as an arsenal on the 15th of June last.

I respectfully renew my recommendation that the captured lands and buildings at Shreveport, Louisiana, and in Walker, Jefferson, Davis, and Marion counties, Texas, which were turned over to this Department at the close of the war, be disposed of. They are of no use to this Department.

I also renew my recommendation that the following arsenals, which are no longer needed by this Department, be sold, viz: Rome, at Rome, New York; North Carolina, at Fayetteville, North Carolina; and Champlain, at Vergennes, Vermont. As the Mount Vernon Arsenal, in Alabama, has been ordered to be transferred to the Quartermaster's Department for Army purposes since the date of my last report, my recommendation for its sale is withdrawn.

I recommend that Congress be requested to authorize the sale of the magazine tract of land near Augusta Arsenal, Georgia. Extensive powder works were built upon it by the confederate government during the war, which are not wanted by this Department. The buildings and machinery are deteriorating, and their care is an expense to the Department.

No payment, except for a few lots, has yet been made on the Harper's Ferry property which was sold, in 1869, in accordance with the terms of the law directing the sale. The first payment should have been made last December, and the second and last payment should be made the 1st of next December. The title to the property has not been trans-

ferred by the United States, except for the few lots above referred to, and for those donated by the act authorizing the sale. Unless full payment for the property shall be made next December, it is my intention to report the fact to you and ask for instructions in the matter.

I still think that a large Arsenal of Construction, and a Powder and Niter Depot, should be established at some suitable points on the Atlantic coast, and I renew the recommendation made in my last report that Congress be requested to authorize and empower the Secretary of War to sell such of the arsenals as in his opinion have ceased to be required, and to apply the proceeds of their sales to the purchase of sites and the erection thereon of buildings for the arsenal and the depot. I respectfully invite attention to the remarks on this subject which are in my last report.

PERSONNEL OF THE DEPARTMENT.

The number of enlisted men of ordnance has been reduced to four hundred and seventy-five. They are employed as guards, mechanics, and laborers, at the arsenals and at the Military Academy.

The act to increase and fix the military establishment of the United States, approved July 28, 1866, gave to the Ordnance Department sixty-four officers and thirteen storekeepers, and the Department was kept up to that number until after the passage of the act approved March 3, 1869, prohibiting promotions and appointments in the staff corps, and which is still in force. Since that time vacancies have occurred which reduce the strength of the Department to fifty two officers and twelve storekeepers; and of the fifty-two officers, two are on the staffs of general officers and four on duty at the Military Academy, leaving but forty-six officers available for duty in the Department.

So long as this law continues in force no promotions nor appointments can be made in the Department, no matter how many vacancies may occur, for the same law which stopped appointments took from the President the power of attaching graduates of the Military Academy to the Department as second lieutenants by brevet, a power which he had held since the organization of the Department in 1838. In justice to the public service and to the officers of the Department, I earnestly request that Congress may be asked to change the act of March 3, 1869, which is referred to, so far as to permit promotions and appointments in the Ordnance Department to be made. The number of officers available for duty in the Department at this time is not sufficient for the proper performance of the duties which are intrusted to the Department, and the interest of the public service requires an increase. The duties of the Department have been in nowise reduced since the passage of the act of July 28, 1866. It is not recommended that any change in the law shall be made so far as it relates to ordnance storekeepers. Their position in the Department is anomalous and no more appointments should be made, but the officers—many of whom are old, meritorious, and highly efficient—should be retained in service.

ARMING AND EQUIPPING THE MILITIA.

This duty belongs to the Ordnance Department, and during the past fiscal year the following stores have been issued to the States, viz:

4 3-inch rifle-cannon, with carriages, caissons, harness, implements, and equipments.

6,874 Springfield breech-loading rifle-muskets, caliber .50.

291 Springfield cadet breech-loading rifle-muskets.

2,083 Springfield rifle-muskets, caliber .58.

210 Spencer carbines.

5 revolvers.

100 cavalry sabers.

90 musician's and non-commissioned officer's swords.

7,211 sets infantry accouterments.

100 sets cavalry accouterments.

100 sets horse equipments.

451,000 cartridges for small-arms.

75 3-inch rifle projectiles.

The act of April 23, 1808, in pursuance of which these issues were made, appropriates the sum of \$200,000 annually for the purpose of arming and equipping the militia of the United States, and this sum, by direction of Congress, is annually divided among the States and Territories according to their representation in Congress. It is the practice of this Department to credit the States and Territories annually with their proportion of this appropriation, and to charge them with the money value of all issues made to them. The States which were not represented in Congress during the war of the rebellion, and subsequently, have not been credited with any part of the appropriation for the period they were unrepresented, but this part of the appropriation has not been applied to the quotas of the other States. It is for you, or perhaps more properly for Congress, to direct how this sum, which has accrued, and which stands on the books of this office to the credit of the permanent appropriation, shall be applied—whether the States which were not represented in Congress shall be credited with their quotas, or whether their quotas shall be apportioned among the other States and Territories. Congress evidently intended in 1808, when it made the permanent annual appropriation of \$200,000 for arming and equipping the militia of the United States, that they should be armed and equipped by the Government, and it is important and proper that they should be, and that States should be encouraged to depend upon the General Government for these supplies. If in 1808, when the population of the United States did not exceed eight millions, the sum of \$200,000 per annum for arming and equipping the militia of the United States seemed necessary, it can hardly be thought that this sum is sufficient now, when the population has increased nearly fivefold; and the States are more desirous of obtaining arms for their militia for drill and instructions than they were in 1808.

Large sums of money were charged against some of the States for arms, &c., furnished by this Department during the war, and other States, equally populous, had no charges made against them during the same period; and it seems to me highly probable that errors occurred in keeping the account with the States which do great injustice to some of them, but which this Bureau has no authority to correct. The principal, if not all, of the issues which were made to the States during the war, were made to them for the maintenance of the Government and the preservation of the Union, and should have been charged, as arms and other stores issued to volunteers, to the United States, and not to the States. If the errors can be corrected they should be. In my opinion it would be fairer and juster to the States to credit them with all issues made to them during the war, and charged on their quotas for arming and equipping the militia, than to let the accounts stand as they now

are on the books of this office. Some of the States are now charged with a greater sum than their annual quotas will amount to in half a century, and under a proper decision of the War Department no issues can be made to States which are charged with arms and other stores in excess of their quotas. I respectfully suggest that it may be proper to invite legislation on this subject.

SEA-COAST GUNS.

In January, 1867, a board, composed of artillery, engineer, and ordnance officers, was appointed by the Secretary of War to fix the armament for the fortifications. The board unanimously reported that 805 smooth-bore guns, (20-inch, 15-inch, and 13-inch,) 810 rifle guns, (10-inch and 12-inch,) and 300 mortars, (13-inch and 15-inch,) would be required in addition to the guns which were then on hand, and recommended their procurement from time to time. The report was approved by the Secretary of War ad interim. Of the guns recommended by the board there were on hand at that time 1 20-inch smooth-bore, 295 15-inch smooth-bores, 59 13-inch mortars; and since that time about 25 15-inch guns have been procured by this Department, making the number about 320. There are no sea-coast rifle guns of the calibers recommended by the board on hand, and with my present knowledge I am unwilling to recommend the purchase of any rifle guns of the calibers recommended by the board for the armament of the fortifications. It is of the highest importance that we should have heavy rifle guns for the fortifications, and it can only be determined by actual experiment how, in what manner, and of what material they shall be made. The experiment must necessarily be costly, but the information to be derived from it will be worth more than tenfold its cost, and I earnestly recommend that authority to begin the experiment be asked of Congress. The principal nations of Europe, fully aware of the necessity of having heavy rifle guns for their coast defenses, have spent millions in their experiments in search of a reliable rifle gun for coast defense. We have confined our experiments to the trial of one or two cast-iron rifles. The results obtained will not warrant me in recommending that any cast-iron rifle guns be procured for arming the forts. We must try some other material for heavy rifle guns. A plan submitted to the Department by a Dr. Woobridge, of New York, by which the gun is made of bronze, and iron or steel wire, impressed me so favorably that I had a small gun, which had been made by the Navy Department, tested, and its strength and endurance were so great that I submitted the result to a board of officers, who recommended that a 12-inch rifle should be made on the plan and tested. The recommendation received the approval of the Secretary of War, who authorized the experiment, and the gun was ordered. The act of July 12, 1870, which took effect a few days before the order for the gun was given, stopped the experiment, by withdrawing the money which was necessary for the experiment from the control of the War Department. I have estimated for funds for making the experiment, and I earnestly hope that it will be authorized by Congress. It ought to be made and without delay.

Our smooth-bore Rodman guns are regarded as reliable and perfectly fit for service. I shall continue to recommend their purchase, but shall spare no efforts to improve the quality of the metal of which these guns are made. Great improvement has been made within the last few years in the quality of cast iron for guns, and I believe that a still further improvement may be made by a change in the treatment of the

metal in the furnace. I am having some experiments made to determine that question, and will submit the result of the experiments to you as soon as it is obtained.

A great improvement in powder for heavy guns has been made by us within the past few years by increasing the size of the grain and thereby reducing the rate of combustion, and it is thought that the powder may be still further improved. I am having some small samples made for experiment, and when tried the results will be reported to you.

My estimate for the next fiscal year includes a large sum under ordnance and ordnance stores, which is intended to be used in altering the 10-inch and 15-inch gun carriages which are now in service. When the 10 and 15-inch guns were adopted and introduced into the service, and iron carriages made for them, the charge of powder for the 10-inch gun was 14 pounds, and that for the 15-inch gun 60 pounds, and the carriages were made abundantly strong to withstand those charges. The charges have been increased to 20 pounds of powder for the 10-inch gun, and to 100 pounds of powder for the 15-inch gun, and it has been found that their carriages must be modified to adapt them for the largely increased charges. The required alterations should be made at once.

Very respectfully, your obedient servant,

A. B. DYER,
Chief of Ordnance.

The SECRETARY OF WAR.

REPORT OF THE CHIEF SIGNAL OFFICER.

17 W

REPORT
OF
THE CHIEF SIGNAL OFFICER, U. S. A.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., November 1, 1871.

SIR: The signal school of instruction at Fort Whipple, Virginia, has been maintained during the past year, and, as in previous years, instruction has been given to officers of both the Army and Navy.

The course of study pursued by the naval officers has been similar to that described in the report of last year, consisting of the theory and practice of military and naval signaling and telegraphy, using as text-books the "Manual of Signals," "Cully's Hand-book of Practical Telegraphy," and "Pope's Modern Practice of the Electric Telegraph."

The officers of the Army were instructed, in addition to the above-named branches, in the outlines of meteorology, including a practical knowledge of the different meteorological instruments in ordinary use. In this branch of study the text books have been Professor Loomis's Treatise on, and Buchan's Hand-book of, Meteorology. Special instructions were also given in the use of the especial system of weather-reports adopted by this office, and in the care and management of stations of observation.

The number of naval officers fully instructed during the year has been twelve, and of officers of the Army, three; three officers of the Army are still under instruction. In addition to this number, two officers were instructed in meteorology alone, they having previously, in 1869, completed the other part of the course. One officer received a leave of absence immediately after his detail, with permission to leave the country, and has not yet returned.

Reference is made to Tables I and II, hereto annexed, in which is a list of all the officers instructed, with the date of report for duty, of announcement as competent as acting signal officers, and the actual amount of out-of-door or field practice had by each. The instruction of naval officers was temporarily suspended on the 10th of July, 1871, the Chief Signal Officer of the Navy representing that the weather during the summer months was, in his view, unsuited for field-work on the part of naval officers. Arrangements are now in process for the detail of another class of naval officers for instruction.

The instruction of the observer-sergeants required for duty in the division of telegrams and reports for the benefit of commerce has been an important feature of the school during the past year. These soldiers have been instructed in the theory, and in, as far as was practicable in the limited time allotted to the course, the practical uses of signaling and telegraphy; they have been schooled in the manual of arms and the duties of the soldier, but principal and prominent attention has been given, in the tuition marked out for them, to the subject of meteorology, in which the course has been as thorough as the nature of the

circumstances would permit. Especial care has been given to that portion of the study relating to the uses of the various instruments with which each station of observation is supplied, and in the preparation of the ciphers and of the different forms employed in making, recording, and publishing the weather-reports, and in the general management of stations; the text-books used have been the "Manual of Signals," "Pope's Modern Practice of the Electric Telegraph," "Loomis's Treatise on Meteorology," with the "Smithsonian Instructions to Meteorological Observers," and the "Instructions to Observer-sergeants" issued by this office.

During the year, seventy-three sergeants have been under instruction. Of this number, twelve have not yet completed the course; two have been assigned to duty in the office of the Chief Signal Officer before completing the course; three were discharged before final examination; twelve failed to pass the examination as to their competency for the management of stations; ten of these latter have been discharged, and two are returned to the signal detachment from which they had been selected for promotion. The remaining sergeants, forty-four in number, have passed the required (observer's) examination and been assigned to duty at stations. Table III, herewith, gives in detail the names of the sergeants, date of report and examination, the result in each case, and the stations at which the observers are now on duty.

Second Lieutenant Allyn Capron, First United States Artillery, who was in immediate charge of instruction at the school as acting instructor at the date of last annual report, continued to act in that capacity until May 18, of this year, when he was relieved from duty, under the direction of this office, at his own request, and returned to his regiment. He was a faithful and energetic instructor, taking a strong personal interest in the work, and under his charge a corresponding degree of interest in their studies was manifested by the classes.

Lieutenant Capron was succeeded by First Lieutenant Robert Craig, Fourth United States Artillery, acting signal officer, who took temporary charge as acting instructor until another officer could be fitted for the position.

First Lieutenant O. M. Mitchell, Fourth United States Artillery, acting signal officer, was assigned to duty as acting instructor June 2, 1871, but resigned his commission in the service June 16; he was succeeded by First Lieutenant G. S. Grimes, Second United States Artillery, acting signal officer, who performed the duties of acting instructor, in addition to his especial duty as post quartermaster, until relieved July 3, 1868. Second Lieutenant C. C. Wolcott, of the Third United States Artillery, having completed his course of study, was announced as acting signal officer and acting instructor July 7, 1871, and remains in immediate charge of instruction at this date. The numerous changes here referred to caused many and vexatious delays, and had an injurious effect upon the school. This effect has been gradually removed since the assignment of Lieutenant Wolcott as instructor. The tuition is now progressing in a satisfactory manner; the services rendered during the past year by the officers and men who have undergone the course is a sufficient commentary upon its value.

The instruction in military signaling and telegraphy, from the Military Academy at West Point, has been meager and unsatisfactory, and does not afford sufficient data for a detailed report here. It is understood, however, that a course has been pursued, and that the cadets of the first and second classes have received a partial instruction in the theory and practice of signaling and telegraphy.

It is in every way desirable that the course at the Military Academy be made as complete as it can be, in view of the brief time which can be devoted to it at that institution, and that it be conducted by an officer himself thoroughly instructed, and in such manner and in such complete communication with this office as is contemplated by the law providing for the discharge of the duties of the signal service.

The recommendation of this office, that the duty be made an especial branch of instruction, and that a merit value be given, affecting the standing of the cadets, as mentioned in the last annual report of the chief signal officer, is renewed.

The instruction in military signaling in the Departments of the South, of the Platte, and of Texas has been, during a portion of the last year, in the charge of acting signal officers regularly instructed under the direction of this office.

The instruction in the Department of the Missouri has been under similar charge during the whole year. The results are exhibited in Table IV, herewith.

In the remaining geographical military departments, viz, those of New Mexico, Arizona, California, and the East, instruction has been attempted at isolated points, but not under the immediate direction of this office. This attempted instruction has been conducted under the provisions of General Order No. 19, Adjutant General's Office, March 18, 1869.

This order makes no provision for the instruction of the instructors, and officers acting under it have found themselves called upon to give instructions in a branch of the service than which none requires more thorough practical knowledge, and wholly in want of practice themselves. It was wise, however, perhaps, that the experiment should be made. It has not been fruitless, for the attention it has caused to be given to the signal service throughout the Army has led to a knowledge of its duties, such as would enable most officers to avail themselves to some extent of expert and instructed signalists in time of war, and it has proven the necessity of the permanent retention of a corps of officers and enlisted men thoroughly instructed and drilled in military signaling and telegraphy. Upon officers and men so instructed in these especial duties only can there be reliance for the proper instruction of other officers and men where these instructions are needed, or for such discharge of the duties in the Army as the country has the right to expect in time of emergency or of war.

The wisdom of those acts of the Secretary of War and of the General of the Army which have established and maintained the signal-service post of Fort Whipple, and the corps of officers and men there serving, needs no other confirmation than the results of the irregular instruction elsewhere attempted throughout the Army.

It is recommended that the instruction in geographical departments, whenever attempted hereafter, should be under the guidance or direction of some thoroughly instructed officer at department headquarters, through whom the necessary reports shall be made to this office, and who shall, in addition, have general charge of the property pertaining to the service throughout that department.

Table IV, herewith, exhibits the signal equipments and signal stores issued during the year to the several military departments.

It has been possible to give but little attention to the practice in field telegraphy and the drills with the field telegraphic train. These specialties of military practice at Fort Whipple are of an importance to the service hardly to be overestimated. The very extensive and important

duties suddenly imposed upon the office of the Chief Signal Officer and the signal service have, of necessity, taxed its abilities to the utmost, and the necessary withdrawal from the detachment of officers and men for duties in connection with the stations throughout the country so reduced its force that thorough drills have been impossible. A minor difficulty has been that the animals necessary for the movements of the trains could not be immediately procured.

Recent enlistments and additions to the detachment have increased its strength, and it is in contemplation to enter upon the drills of the train with the least practicable delay. The preliminary drills are already commenced.

During the past year experimental improvements have been made upon the vehicles of the train. It is desirable that every facility should be had for practice with and improvements of the service and of the drill. It is not necessary to comment on the value to the Army of a well-organized and properly equipped telegraphic service.

The duty discharged at Fort Whipple, Virginia, has been, during the past year, of paramount importance to all divisions of the signal service. It has been embarrassed to some extent by the frequent changes of officers, incident to the fact that the details for the service have been temporary, and by that discouragement of officers and men which always attends such changes.

The buildings at the fort are not well suited to the purposes to which the post is now devoted. It is recommended that permanent and better quarters and stables be provided and facilities given to place the post and the school maintained at it in the best condition. A principal point will have been gained when an assignment of an officer of suitable rank can be made to the command, and both officers and men there serving shall be encouraged to attempt perfection in their especial duties by a reasonable certainty that their duties will be permanent.

The number of non commissioned officers and privates on duty at Fort Whipple is eighty-one.

DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

At the date of the last annual report of this office the organization, form of duty, and plan of supply and of service of the office division of telegrams and reports for the benefit of commerce had been in part provided, but had had no test of actual practice.

On November 1, 1870, at 7.35 a. m., the first systematized synchronous meteoric reports ever taken in the United States were read from the instruments by the observer-sergeants of the signal service at twenty-four stations, and placed upon the telegraphic wires for transmission.

With the delivery of these reports at Washington, and at the other cities and ports to which it had been arranged they should be sent, which delivery was made by 9 a. m., commenced the practical working of this division of the signal service in this country.

The pleasant feeling with which the service was everywhere recognized, and the aid everywhere tendered and rendered the office, are known to the Secretary of War.

On the first day of report the tabular bulletin reports were bulletined and furnished at twenty-four cities. The organization and instructions seem to have been sufficiently minute to guard against accident or error, and the form and plan commenced with the first morning report has

continued without need of alteration, as that under which the labor of the office for the past year has been conducted.

Paper 1 exhibits the bulletin as this day published at Washington, and summarizes the reports distributed to the different stations. As soon as the working of the organization thus tested had proved a success, and the correct and prompt receipt of the reports was no longer doubtful, it became a duty to provide in some way for giving notice of the approach of storms which the reports often heralded. The need for this duty was especially urgent upon the lakes. The first storm-warning was telegraphed and bulletined along the lakes on November 8, 1870.

In November, 1871, Professor I. A. Lapham, of Milwaukee, a meteorologist well known throughout the lake region, was employed as assistant to the Chief Signal Officer, and stationed at Chicago, with special reference to the supervision of the signal service on the lakes. His immediate supervision of this portion of duty ceased with the close of navigation.

The reports of Assistant I. A. Lapham, herewith (Papers 2 and 3) exhibit the character of his labors, their extent, and, to some degree, the results had from them. In addition to his duties in connection with the preannouncement of storms, this gentleman has prepared a series of valuable tables for this office.

In the early winter of 1870-'71 the efforts of the office were directed to the extension of the system of stations as rapidly as it was possible to supply them with observers and instruments.

On January 15, 1871, the stations on the east Atlantic coast were added to the list of those reporting.

The section from Chicago to San Francisco, including the station at Corinne, commenced reporting February 2, 1871.

The stations on the coast of the Gulf of Mexico, and in the valleys of the Ohio and Mississippi Rivers, have been established during the past summer.

The issue of the tabulated reports at the different cities was followed, with as little delay as practicable as the service extended, by an exhibition at the rooms of the boards of trade and chambers of commerce, or in other prominent places in the different cities, of weather-maps, on which the meteoric conditions at the stations throughout the country were exhibited by symbols. In the "instructions to observer-sergeants," a copy of which is herewith, (Paper 4,) a full description of these symbols and their uses is given. Maps of this description are now displayed daily at forty-five of the principal stations.

Maps similar in style are exhibited in the office of the Chief Signal Officer, and, during the sessions of Congress, in the hall of the House of Representatives. The preparation of graphic weather-charts became next incidental to the receipt and consideration of reports from stations so widely extended. Charts of this kind were drawn to embrace the reports of the earliest dates.

The meteoric conditions were exhibited on these charts by printed symbols and figures for the readings of the instruments placed at each station. The graphic chart herewith (Paper 5) illustrates the character of these papers. It was desirable that copies of these charts should be furnished the different scientific institutions in the city of Washington and elsewhere throughout the country. The mode in which these charts are prepared is described at length hereafter.

The successful issue of these charts at Washington has led to the publication, under the direction of this office, of similar charts at New York,

Philadelphia, Cincinnati, Chicago, and New Orleans. It is contemplated to extend the publication to other principal cities.

The organization of the telegraphic circuits, over which the reports are received at this office, and which permits the telegraphic meteoric information received at Washington to be at the same time communicated in the different cities, renders the publication of charts elsewhere easily practicable.

The popular attention was early attracted by these publications. It soon became evident that the popular will, as well as the views of eminent scientific men, required the publication of deductions of some kind had from the material received at this office.

The services of Professor Cleveland Abbe, A. M., assistant to the Chief Signal Officer, as meteorologist, were secured on the 3d of January, 1871, since which date he has been on duty in this office.

Professor Thompson B. Maury, A. M., entered upon service as assistant in the office June 18, 1871.

The issue of synopses and probabilities, as they are styled, was commenced by the office on February 19, 1871, and has been made thrice daily since that date.

The synopses consist of a synoptic view of the meteoric condition of the United States, as had from the data received at each regular report.

The probabilities are the deductions made by the office, from the data in its possession at the time of each report, as to the meteoric conditions probably to be for the eight hours then next ensuing.

Copies of these synopses and probabilities are furnished at the moment of their issue to the different press associations in the United States. They are also printed upon the graphic weather-charts issued by the office.

By the display of weather maps and bulletins, the issue of the graphic charts, the tabulated meteoric reports, and the synopses and probabilities, provision seemed to have been made for that publication of meteorological information at the different ports and cities of the United States with which the office had been charged. A popular attention to the subject of meteorology had been excited, and a popular instruction in some of the uses of the science was progressing rapidly.

It was deemed advisable to furnish, for general distribution, suggestions as to the practical use of the information so widely diffused, and to embody in a compact form some of the rules and generalizations bearing upon that use.

On August 2, 1871, the brochure herewith (Paper 6) was issued from this office. It was the object of this publication to put it in the power of the largest number to make use of, and to profit by, the labors of this office, and to afford the means by which at once to supplement, judge of, and aid the work of the Department. The paper has been widely distributed, and copies have been furnished the press, the boards of trade, and chambers of commerce, agricultural societies, and other associations whenever it has been thought the information it contains could be used to advantage.

Early in October, 1871, an examination of the experiments had daily for some months in the office, in the preparation of detailed synopses, on which had been indicated the times and places at which signals of caution or of safety ought to be shown, indicated that the office would be warranted in assuming to display cautionary signals at twenty ports on the Atlantic coast, the Gulf coast, and on the northern lakes. The period from October 1 to October 23 was devoted to giving proper notification of the points at which the signals would be displayed, their

character, and their exact meaning, and to the necessary preparations at the different signal-stations.

The display of cautionary signals was ordered to be at the designated stations of the observer-sergeants on and after Wednesday, October 23, 1871, whenever such display should, in view of the meteoric information had at this office, be deemed necessary. Each signal is required to be ordered by telegraph from this office, and remains displayed until it is ordered down by the same authority.

The cautionary signal—a red flag, with black square in the center by day, and a red light by night—displayed at the office of the observer, and other prominent places throughout any city, signifies—

1. That, from the information had at the central office in Washington, a probability of stormy or dangerous weather has been deduced for the port or place at which the cautionary signal is displayed, or in that vicinity.

2. That the danger appears to be so great as to demand precaution on the part of navigators and others interested, such as an examination of vessels or other structures to be endangered by a storm, the inspection of crews, rigging, &c., and general preparation for rough weather.

3. It calls for frequent examination of local barometers, and other instruments, and the study of local signs of the weather, or clouds, &c. By this means those who are expert may often be confirmed as to the need of the precaution to which the cautionary signal calls attention, or may determine that the danger is overestimated or past.

The fact that no cautionary signal is displayed, or that it is ordered down at any station, indicates that there is no information in the possession of the office which would call for especial precaution at that station. The pamphlet herewith (Paper 7) gives at length the meaning and the uses of the signal. It is designed to furnish copies of this paper to every vessel of both the merchant and military marine of the United States.

The cautionary signal was ordered to be shown when necessary at the following posts, viz :

Baltimore.	Mobile.
Boston.	New London.
Buffalo.	New Orleans.
Cape May.	New York.
Charleston.	Norfolk.
Chicago.	Oswego.
Cleveland.	Portland, Maine.
Detroit.	San Francisco.
Galveston.	Savannah.
Grand Haven.	Toledo.
Key West.	Wilmington, North Carolina.
Milwaukee.	Jacksonville, Florida.

In addition to the exhibition of the signal at the ports named, the statement of synopses and probabilities furnished the press tri-daily has added to it the names of the ports at which the cautionary signal is at any time ordered to be displayed, and also the names of those at which, being displayed, it has been ordered down.

The display of the cautionary storm-signal had practical effect for the first time in the United States on the night of Tuesday, October 26, 1871, when the signal was ordered at 7 p. m. to be displayed at the port of

Oswego, New York. The signal so displayed was ordered down at 1 a. m. on Friday morning, October 27.

The service of the cautionary signals has imposed additional labor upon the force at the different stations, by the fact that the station must be ready to receive the telegraphic orders at night as well as in the day. The details for the duty must be so arranged that the signal so ordered will be promptly and well displayed, and care had that it so remains while the need for caution is supposed to exist. The frequent calls for information which the exhibition of the signal always brings to the office of the observer, to which those interested are by public notice referred for such intelligence, must also be answered.

The character of the meteoric observations at the different stations, and the cipher in which the readings are transmitted, have remained as described in the last annual report of the office.

The organization of working-forms of telegraphic circuits, explained at some length in the same report, has proven capable of indefinite extension. Experience has confirmed the opinion last year expressed, and has shown that, with working-forms of telegraphic circuits properly arranged, meteoric observations taken synchronously around the globe could be as readily made available for scientific purposes as those of a continent have been. The working forms of circuit herewith exhibit those under which telegraphic service of the past year has been rendered.

The organization of circuits reported in the last annual report, and extending to those of the Western Union and International Ocean Telegraph Companies, continued in effect until March 4, 1871, when it was terminated on the part of the Western Union Telegraph Company in consequence of misunderstanding as to the powers of the United States in relation to the telegraphic lines. These powers, as expressed in the act of 1866, secure to the United States precedence for the transmission of Government dispatches over lines which have availed themselves of its conditions. The act also imposes upon the Postmaster General the duty of fixing annually the rates at which such messages shall be transmitted. The sudden cessation of reports extending in their consequences to so many interests might have proved disastrous. The War Department, charged with the duty of collecting them, was placed in an unfortunate position. In this emergency the Franklin, the Atlantic and Pacific, and the Pacific and Atlantic Telegraphic Companies tendered their services promptly, and assumed the transmission of reports from all points to which their lines extended, with such effect that these companies receiving notification of the requirements of the service only at 10 a. m. on March 5, a sufficient number of the regular reports were received over their lines the same day to permit the usual press-report to issue from this office that evening. The International Ocean Cable Telegraph Company continued its service for the Department without interruption, and with a spirit of accommodation.

The subject of the relation of the United States to the telegraph companies being brought, by the Secretary of War, to the attention of the Attorney General of the United States, was by him placed in immediate charge of the Hon. William Whiting, assistant to the Attorney General of the United States. There could be, in the view of this officer, little question as to the rights or powers contemplated by the law. Several conferences, in which officers of this office took part, were held with the representatives of different telegraph companies, the conferences being in New York and at Washington. These meetings resulted in a satisfactory adjustment of all questions between the United States and the telegraph companies, both as relating to the special duties of

the signal service and the general telegraphic business of the United States. The conclusions are exhibited in the paper, (Paper 35,) and in the order of the Postmaster General, (Paper 36,) who has paid this office the compliment of accepting as just the rates recommended by it.

The relations had at this time with the telegraph companies of the United States are satisfactory. Embarrassments, however, arise, which, in the main, cannot be remedied until the United States secures, by some arrangement, the absolute control of the lines extending over its territory.

The working-forms of circuits herewith are made for the Western Union Telegraph Company, the Northwestern Telegraph Company, the Montreal Telegraph Company, and the International Ocean Telegraph Company; the former being the only companies possessing facilities for uniting so many parts of the continent with an organization of working so minute, and the latter controlling the cables to Key West, and holding by its wires and privileges the United States termini of the West Indian cables. The wires of these companies enter the telegraphic rooms at this office, and afford, if necessary, communication over almost any line within the United States; the failure of one line being thus to be made good by the employment of another. By such connections, telegraphic communication can be extended wherever telegraphic lines are in operation throughout the world. Of the service of the lines upon this continent, the Secretary of War has had illustration in his inspections of this office. As a single example, reports were called for on these occasions, and replies were received in a total time of eight minutes for the transmission of the message to and from San Francisco, California the working being over a single circuit of three thousand four hundred and seventy-six miles in length.

It is a fact illustrating the rapid extension of telegraphs throughout the world, that from this office can be had to-day communication by lines of telegraph reaching by their connections the coast of the Pacific on the west, and extending eastward to the eastern coasts of China and Japan.

The one link of the Pacific cable is wanting to girdle the world. Northward the lines reach those of the Canadas and British Possessions; southward they connect the West Indies and stretch toward South America. The advantages yet to result from a proper connection of the telegraphic system everywhere with systems of meteoric report can be contemplated in imagination only.

The telegraphic service of this office has been under the immediate supervision of George C. Maynard, esq., electrician, by whom it has been skillfully conducted.

The subject of a cipher, by which to further condense the telegraphic reports, has continued to receive attention. It is contemplated to commence, so soon as careful experiment shall have proved it practicable, the use of one prepared in this office, by which it is hoped the character of the reports will be improved without increasing the expense of transmission.

During the past year applications have been made by boards of trade of cities in the river valleys to have added to the telegraphed bulletined reports of the signal service a telegraphed report of the rise or fall of the greater rivers. An examination of this subject, showing that, by the addition of two words per day to a single one of the cipher reports already had from the river stations, the requisite reports might be given, and that the expense of the necessary apparatus will be trivial, it is proposed to embody this information with the reports, as having a direct connection with the meteoric information they already contain.

During the eleven months ending September 30, 1871, the aggregate number of words of regular weather-reports received at the office of the Chief Signal Officer in Washington was five hundred and sixty-one thousand nine hundred and twenty-nine, and the total number of words that was transmitted during the same period over the several circuits amounted to one million seven hundred and fifty-nine thousand nine hundred and fifty-two. These numbers do not include the service-messages and other telegraphic business of the office, which would swell the gross amount to about two million words. Tables 6, 7, 8, 9, and 10, herewith, give the service in detail.

The subject of the study and consolidation of the reports daily received at this office, and the preparation of deductions to be had from them, has been under the immediate and able supervision of Professor Cleveland Abbe, A. M., assistant. This officer has devoted himself to these duties and to others of the most onerous description with rare fidelity.

The favor with which the Synopses and Probabilities issued by the office have been received, and the commendatory expressions of scientific meteorists, sufficiently evidence the skill with which he has discussed the mass of material laid before him. This officer has rendered very valuable assistance in the preparation of the publications of this office—the circulars in relation to the practical use of meteorological reports and weather-maps issuing from it. It is believed that some of the rules and generalizations contributed by him to these papers are now for the first time announced. (Papers 6 and 7.)

The services of Professor Thompson B. Maury, A. M., have also been employed as an assistant in this Department. A series of meteorologic charts, synopses, and probabilities has been prepared for file in this office by assistant Maury.

First Lieutenant Robert Craig and Second Lieutenant A. W. Greely, acting signal officers, United States Army, have been employed upon the studies and in the preparation of the charts and papers necessary to fit them for duties in connection with this service.

The system of synchronous reports, and their regularity, has afforded unusual facilities for the study of the atmospheric conditions of the continent, and the changes incident to the different conditions.

During the year the reports received at the office of the Chief Signal Officer tri-daily, commencing with those of November 1, 1870, have been charted, three charts, one for each report, being draughted for each day.

The meteoric condition at each station, and the isobars for the United States, are exhibited on these charts. Accompanying each has been a synopsis of atmospheric changes and of the atmospheric conditions for the twenty-four hours preceding the hour at which the chart is timed, and a deduction then had as to the changes probably to follow.

A practice for the duties which the office contemplated as necessarily to be discharged, by the display of signals, has been had by the draughting, in tabular form, thrice daily, a detailed synopsis, which relates to designated sections of the country, and enumerates the points at which a cautionary signal might be properly exhibited. It has been only after the comparison of these sheets with the results had from the reports collected at this office has seemed to justify the display of cautionary signals, that the responsibility of ordering such display has been assumed.

There have thus been drawn and filed in the office of the Chief Signal Officer one thousand and ninety-five charts. The studies of each are drawn upon the face of the chart in such manner that the photographic copies of the charts alone, bound into volumes, will give a meteoric re-

cord for the United States perhaps not paralleled in kind by any before made. The securing of such a record, the establishing by practical example how meteorological reports may be taken over regions, no matter how extensive, and how telegraphs may be organized to transmit such reports, would, of themselves, have made fair return, had there been no other for the appropriation expended. In the preparation of the charts referred to, the course of more than three hundred areas of high barometer, and of about the same number of areas of low barometer, have been traced with the attending changes of weather.

From January 19, 1871, to November 1, 1871, eight hundred and forty-six detailed sheets of synopses have been tabulated to accompany sheets exhibiting the changes of weather deemed probable for the succeeding day. Papers 38 and 39 exhibit the plan of this work.

Press reports of the general synopses and probabilities, as they are styled, have been furnished the press, as heretofore mentioned in this report. The wide diffusion given these reports by the relations the office has established with the press is evidenced by the fact that it is estimated, computing the number of copies published at each edition of each newspaper in which reports or bulletins have appeared, the aggregate number of copies of the reports furnished from this office, which have been laid before the public, has reached a total of sixteen million. This extensive publication has been without cost to the United States. It is computed that in the morning editions of the New York newspapers alone, two hundred thousand copies are thus distributed daily. In addition to these press-reports, special reports are occasionally requested by ship-owners and others, and have been furnished. The Memphis Board of Trade recently applied for special reports during the meeting of the Agricultural Fair in that city.

As instances of particular storms described in their course from day to day in the general reports from this office, may be cited those of November 22, 1870; February 5, March 9, May 9, August 16 and 22, September 27, and October 12, 1871.

The comparison of the forecasts of the weather, or "probabilities," as they have been styled, deduced from the study of the relations of each regular report to those which have preceeded it, together with the meteoric conditions reported as actually existing over those sections of territory to which the "probabilities" have referred, has shown that of the predictions 69 per cent. may be held to have been fulfilled. A higher percentage of verifications results, if allowance is made for the meteoric changes that may have occurred within an hour of the times stated in the predictions. The percentage of such partial verifications is considered to be one of about 21 per cent.; the total of verifications and partial verifications being thus in the proportion of ninety to each one hundred of the predictions announced. It is not deemed advisable that the partial verifications be considered for any practical purposes. It is proper, therefore, to limit the official claim of the office to the fact that 69 per cent. of the forecasts made of record, and published by it, have been verified. It will be the aim of the office, with improved organization, larger experience, and established facilities, to increase this proportion.

It must be remembered, in apology for the failures, that the duties of the signal service require very rapid action. The reports are no sooner received at this office at the time of each reporting than they must, to meet the demands of the press for speedy publication, be discussed, the deductions made (written out in form) and telegraphed to the different cities in a period of time limited by minutes. Thus the

midnight report is made from observations taken at 11.35 p. m., (Washington time,) at stations on the Pacific, in the interior of the continent, in the Mississippi valley, throughout the States east of the Mississippi, upon the Atlantic and Gulf coasts, and upon the shores of the northern lakes. These reports must be concentrated at Washington, consolidated, the deductions made and reported at 1 a. m., at which exact hour the press-report is telegraphed from this office. The average time from the moment at which the observations are made at the stations, near and distant, to that at which the results are reported and telegraphed to the press, after they have been received and discussed at this office, has been eighty-five minutes.

An advantage is had in the fact that the reports to be issued follow each other so rapidly—the greatest interval being nine hours—each may be regarded rather as a supplement of the one that preceded it than a solitary report to be made complete from a single series of data.

Especial attention has been given by the office to the subject of the accurate reductions of the barometric readings (observations) made at the different stations to the hypothetical readings at sea-level.

A series of tables for this purpose has been prepared by Professor I. A. Lapham, assistant. A second series, to be made by methods original with Professor Abbe, assistant, is in course of preparation. The tables will be prepared for all the stations.

In this connection it is proper to refer to a difficulty encountered, which extends in its effects beyond its mere relation to the correctness of the meteoric observations.

The altitude of the different stations above the sea-level ought, of course, to be accurately known. In some cases the exact and satisfactory determination of the elevations are not to be obtained. The altitudes of the different signal stations of observation, once properly determined, the barometrical observation had at them becomes a reliable base to which to refer hypsometrical observations had in reconnaissances, surveys, or exploring expeditions. In view of the importance of this subject to all interests of internal improvement, of railroads, canals, &c., the institution of a system of accurate levelings to those stations to which they are needed seems warranted.

A station of observation has been maintained since December 15, 1870, on the summit of Mount Washington, at an elevation of 6,290 feet above the sea. The occupation of this summit for meteoric observation in winter was urged by Professor C. H. Hitchcock, State geologist of New Hampshire, and for a portion of the time during the past winter it was occupied, in common with a party there stationed under his directions by an observer-sergeant of the signal service making the observations for this office. Since June the station has been occupied by the observers of the signal service alone.

The observations made in the higher aerial currents are of especial value in relation to some of the duties of practical meteorology. It is desirable that other mountain stations should be established, and similarly provided, along the Apalachian Chain, as at the Black Mountain, South Carolina, White Top, Virginia, and others to be selected, and that these, together with certain special stations on the western plains, should be provided with self-registering meteoric apparatus.

It has been the aim of the office to extend its system of synchronous reports, collecting the material for future studies by observations made at the same hour, wherever there has been the opportunity to reach by exploring parties or expeditions distant points, or those of the meteorology of which little is known. With this view, at the request of

Captain C. F. Hall, commanding the *Polaris* and North Polar expedition, and with the approval of the Secretaries of War and of the Navy, an observer-sergeant, equipped with carefully selected instruments, was detailed to accompany the expedition. One series of observations to be made by this observer, will be, so far as practicable, synchronous with those on that day making at the different stations in the United States.

It is deemed desirable to secure reports of observations from some points, as Pembina, Sitka, the Sandwich Islands, which as yet can be reached only by mail.

It is proposed to give a still wider extent to the synchronal system of observations upon the ocean, by seeking the assistance of intelligent ship-captains and others making voyages at sea who will be willing to make the observations at the designated times. A form of "log," or record, (Paper 37,) has been prepared for such use. Though these observations may lack the certainty of those officially made, their value, as supplementary to the regular reports on land, will be readily appreciated by meteorists. The observers will receive copies of the publications of this office.

With the rapid extension of telegraph cables, and the results of a years' experience in the concentration of telegraphic reports, the idea of national systems of isochronal observations, to be internationally interchanged, referred to in the last annual report of this office, seems easy of realization. It is already certain that, to complete the system of the United States, stations of observations should be had in the West Indies, on the Windward Islands, and at tropical stations in South America.

The international co-operation of Spain, England, France, and Denmark is needed for this purpose. So far as the service of the United States is concerned, the co-operation to be thus desired need extend only to the assent to the establishment of the stations and the transmission of the cipher report. An ample return for this much of courtesy can be proffered in the furnishing to the governments named copies of the observations made for the service of the United States, to each of which they are of value.

The benefit to accrue to all commercial interests when, at the principal ports of any coast, the meteoric conditions can be found announced for all that coast, (as now in the United States,) or even for the trans-oceanic coast, need not be commented upon.

In anticipation of such uses for meteoric knowledge, it seems proper to invite attention to the aid to be had in making them practicable by the services of the officers of the Army and Navy, and to express the hope that, in the courses of the military and naval schools, at West Point and Annapolis, some study of meteorology may have place.

It has not been possible to carry into effect the plan of a model observatory, at which the different varieties of self-registering and other meteorological instruments might be compared and tested. The contracted building in which the office has been located, has not been suited in any part of it for the purpose. The project has not been abandoned. Standard and ingeniously devised instruments have been procured from Europe and from meteorologists in the United States. Arrangements have been made by which an instrument-room, to answer sufficiently well a temporary purpose, will be had. It is contemplated to mount all the instruments which have been proved, together with such as may be invented and come to the attention of this office, in this room, for the study of their peculiarities and to test them.

The opinion last year expressed as to the great value to the United

States of the records to be made by self-registering instruments properly placed, as, for instance, at the capitol city of each State, remains unchanged. It is eminently proper that facilities for the best study and use of instruments be had.

A properly devised and constructed observatory building, and one so located as to be free from local disturbances, as at some point in the public grounds, will, it is probable, be ultimately needed for such purposes. The expense of such a structure would be trivial in comparison to the advantages to be derived from its use.

The great fires in the Northwest, at Chicago, and in the northern parts of Wisconsin and Michigan, have afforded an opportunity for inquiry, whether any theories of meteoric effects were to be established by them. It is probable that burnings upon a similar scale will not again occur in this country.

Professor I. A. Lapham, assistant, has been requested to examine and report minutely upon the subject, visiting, if necessary, the scenes of the conflagrations.

A valuable paper has been already prepared by him upon the relation of such fires to the formation of prairies. Subjects of this nature having an important bearing upon agricultural interests are, by the necessary duties of the office, frequently brought under consideration.

The very general expectation of agriculturists that, in some way, the duties of the office in reference to the approach and force of storms would be made to contribute to their interests, has found frequent expression in letters and communications from societies and associations. It has been the desire of the office to comply with the wishes of a class so eminently entitled to consideration as the mass of the intelligent farmers of the country, in so far as was practicable without any diversion of the duties of the office. For this purpose the circular papers 40 and 41 were prepared and have been issued. Copies of all meteorological bulletins and the weather-charts of the office are furnished the Bureau of Agriculture. The reports necessarily collated in the publications of the office, such as the bulletins at the stations and the press reports—and these latter reach points as well in the interior as upon the coasts—are sufficient of themselves to enable farmers, as well as other classes, to better judge of the probable weather than they have been able to do at any time previous to the issue of such reports.

This incident benefit was not contemplated at the commencement of the service, and the reports were not drawn to produce it. It seems probable that if the means were available for increasing the number of interior stations, a corresponding increase of advantages would accrue to the inland interests, while a greater certainty of protection would be had for the coasts with every addition of stations. The number of stations ought to be largely increased.

The following is the record, given alphabetically, of the stations of observation under the direction of this office:

AUGUSTA, GEORGIA, (No. 23.)

The office is located on McIntosh street, one block from the telegraph-office and the board of trade rooms, and about the same distance from the principal business houses of the city. The roof of the building occupied is flat, and being several feet higher than any of the surrounding buildings, gives a full exposure to the wind-vane, anemometer, and rain-gauge. The instrument-shelter is a modification of the Smithsonian

plan, having louver-boarded sides, tight roof, and open bottom, and projecting from a window of the observer's office.

Sergeant James R. Allen, who was assigned to duty at this station, commenced making telegraphic reports on the morning of November 2, 1870, and has continued them regularly to date. Since June 12, 1871, he has been assisted by Private Frank Mangels, as the increased duties of the station rendered assistance necessary. Full reports are received here from all other stations, and it is also the point of transfer to and from the New Orleans circuit. Nine bulletins are issued twice daily, and displayed in the principal public places of the city. Two daily newspapers publish the synopsis and probabilities regularly, but do not print the tabular report.

Latitude of station.....	33° 28'
Longitude of station.....	81° 53'
Elevation of barometer above sea-level.....	173 feet.

The instruments in use are Green's standard barometer and thermometer, one hygrometer of the Glaisher model, one Robinson's anemometer, one copper rain-gauge, and one large wind-vane; all of which are in good condition.

BALTIMORE, MARYLAND, (No. 18.)

At this station the office is located at the corner of South and Water streets, and has remained unchanged since the occupation of the station. It is only one square from the telegraph-office, and about the same distance from the principal newspaper offices, the post-office, board of trade rooms, and exchange reading-room, and within half a square of ten shipping-houses and four marine insurance companies. The exposure of the vane, anemometer, and rain-gauge is good, as there are no high buildings to obstruct the free circulation of air for several squares, and then only isolated ones that are higher than the office. The instrument-shelter is a modification of the Smithsonian plan, and the arrangement good, being louver-boarded on sides and front, with tight roof and open bottom, and is built out from a window facing the north.

The station was occupied and the office selected by Sergeant Faherty, in the latter part of December, 1870, but reports were not made until the morning of January 1, 1871, at which time Sergeant J. E. Cowan was in charge, and continued so until March 27, when he was relieved on account of alleged misconduct, and was succeeded by Private Singleton, who had been previously acting as assistant observer, and who managed the station alone and in a satisfactory manner until called in for promotion, when the present observer, Sergeant H. J. Penrod, was placed in charge May 11. An assistant was sent to this station on the 26th of May, as the work was found too laborious for one man to perform well. Full reports from all other stations are received at the station. Six bulletins with the synopsis and probabilities, and five of the manifold maps, are issued in the morning, and five bulletins in the afternoon, and posted in the most prominent public places.

Five daily papers are supplied with the midnight report, and two of them, the Sun and American, publish the full tabular report; two of them, the Correspondent and the Wecker, publish an abstract, and all give a synopsis. The board of trade of this city has appointed a committee, to whom all meteorological matters connected with the signal office are referred.

Latitude of station.....	39° 18'
Longitude of station.....	76° 36'
Elevation of barometer above sea-level.....	45 feet.

Instruments at station are: one barometer, one thermometer, one hygrometer, one anemometer, one rain-gauge, and one wind-vane; all standard and in good condition.

A large weather map, furnished by this office, is hung in the Exchange reading-room, and is changed each morning by the observer.

BOSTON, MASSACHUSETTS, (No. 13.)

The office of the observer at this station is located at 103 Court street, in the business center of the city. The distance to the telegraph-office is four squares; to the newspaper offices from four to six squares; and to the Merchants' Exchange, three squares. The vane, anemometer, and rain-gauge are well exposed upon the top of a cupola on the office-building, and the instrument-shelter, built after the Smithsonian model, projects from a window of the cupola. The station was occupied and office selected in the old State House in October, 1870, by Sergeant Lloyd, but he was relieved by Sergeant Daboll before the reports commenced, on the morning of November 1, 1870. The change of office was made in January, 1871, on the recommendation of the meteorological committee. Sergeant Daboll being relieved May 31, on account of ill health, was succeeded by Sergeant H. E. Cole, who now remains in charge. An assistant was sent to this station January 10, 1871.

Full reports are received here from all other stations. Five morning bulletins with synopsis and six manifold maps are issued and properly posted, and two each of afternoon and midnight bulletins. Three evening papers, the Transcript, Traveler, and Journal, and four morning ones, the Herald, Journal, Post, and Advertiser, are supplied with press reports, and also print the current synopsis and probabilities. A large weather-map is hung in the Merchants' Exchange, and the symbols changed each morning.

Latitude of station.....	40° 20'
Longitude of station.....	71° 03'
Elevation of barometer above sea-level.....	82 feet.

The instruments used are: one barometer, one thermometer, one hygrometer, one anemometer, one rain-gauge and one wind-vane; all of the standard patterns, and in good order.

A meteorological committee has been appointed by the board of trade at this station, and its members have rendered valuable assistance to the observers during the year.

Office-rent, \$18 per month.

BURLINGTON, VERMONT, (No. 45.)

The observer's office is located on the third floor of the building known as the City Hotel, on one side of the public square, around which are located the court-house, city-hall, principal hotels, telegraph and express offices, and many of the principal business houses.

Upon the roof of the building, which is flat, a raised platform has been built of sufficient height to clear the top of the parapet, with which a portion of the roof is surrounded, and on this platform the wind-vane, anemometer, and wind-gauge are placed. The exposure is good and the circulation of air unobstructed.

The instrument-shelter projects from a north window in the office, and is built after the Smithsonian plan, the instruments being so placed that they can be read through the window without opening it.

The station was opened and office selected by Sergeant R. R. Martin,

in the latter part of May, 1871, and reports have been regularly made since the morning of May 24, 1871. Sergeant Martin was relieved on the 17th of August by Sergeant George H. Ellery, who still remains in charge. There is no assistant, as the number of reports received is so small that the work can be safely performed by one man.

Reports are received here from five other stations, and two bulletins of the morning and afternoon reports are issued. Local observations only are published by the press.

Latitude of station.....	44° 29'
Longitude of station.....	73° 11'
Elevation of barometer above sea-level.....	401 feet.

Manifold maps are not issued at this station, the number of reports received being too small to make them of value. The instruments now in use are: one barometer, one thermometer, one hygrometer, one anemometer, one rain-gauge, and one wind-vane; all of which are in good condition.

A meteorological committee has been appointed by the board of trade, and its members have materially assisted the observer in establishing the station.

Rent of office is \$10 per month.

BUFFALO, NEW YORK, (No. 33.)

At this station the observer's office is located in Weed's Block, on Main street, on the fourth floor. The situation is a good one, and in the immediate vicinity of the post-office, custom-house, and different telegraph-offices. The office was originally located in the same building as the Western Union Telegraph Office, at 223 Main street, but was soon removed by orders from this office. The office selected by the observer was at the corner of Main and Seneca streets, and was pronounced unsuitable by the inspecting officer, who visited the station August 24, and who removed it to its present location.

The roof of the building is flat, and offers a good exposure for the vane, anemometer, and rain-gauge. The instrument-shelter is built after the Smithsonian plan, but with louver-boarded sides. It projects from a window on the east side of the observation-office, and the facilities for reading the instruments through the window are good.

The station was established by Sergeant W. F. Slater, and reports have been regularly made since the morning of November 1, 1870. Sergeant Slater still remains in charge, and has had an assistant since January 25, 1871.

Full reports from all other stations are received, and five morning, three afternoon, and two midnight bulletins issued. The newspapers are regularly supplied with the press report at the midnight and morning observations. All papers here print the synopsis and probabilities. Three manifold maps are issued each morning.

This station is provided with a large weather-map, which is hung up in the board of trade room, and the symbols changed each morning.

Latitude of station.....	42° 53'
Longitude of station.....	78° 55'
Elevation of barometer above sea-level.....	624½ feet.

The instruments now at the station are: one barometer, one thermometer, one hygrometer, one anemometer, one rain-gauge, and one wind-vane; all of the standard patterns and in good condition.

The board of trade has appointed a meteorological committee, which

has rendered valuable service to the observer. I regret to report that the observer has not performed his local duties with the proper amount of energy during the year, but all reports to the office have been made regularly and properly. It is proposed to remove him to a less important station, and fill his place with a more energetic man.

The office consists of two rooms, for which \$15 per month are paid.

CAPE MAY, NEW JERSEY, (No. 54.)

The observation-office is located within three squares of most of the principal hotels, two squares from the newspaper offices, one square from the telegraph-office, and in full view of Cape May light-house. The location is a good one for the proper exposure of instruments, and easily accessible to visitors. The building has a sloping roof, and it was necessary to put up a platform above the ridge to place the vane and anemometer upon. The rain-gauge is placed upon the ground and well exposed. The instrument-shelter is of the Smithsonian pattern, with sides and front louver-boarded and the bottom left open. It projects from a north window of the office, and the instruments are read through the glass as at the other stations.

Sergeant Theodore F. Townsend is in charge of station, and commenced transmitting reports on the morning of May 24, 1871. He has no assistant, as no reports are received at present from other stations, although it was intended to receive all sent over the coast circuit. The synopsis, however, is received regularly and posted properly in the principal public places. Full reports were received for a few days in July, but were stopped by the telegraph company until an additional wire could be built. There seems to be no necessity for sending anything to the station but the synopsis, except during the summer months, when the hotels are filled with visitors from different stations of the country, and who are naturally curious to know the state of weather at their respective homes.

Latitude of station.....	39° 00'
Longitude of station.....	
Elevation of barometer above sea-level.....	19½ feet

The station is supplied with a full set of standard instruments, and all of them are in good condition. The large wind-vane is protected by a lightning-rod, put up by the office at the request of the proprietor.

The observer reports a gratifying interest manifested by citizens and visitors in the labors of this office.

The amount of rent paid is \$18 per month.

CAIRO, ILLINOIS, (No. 53.)

The office is located in the City National Bank building, on Ohio levee, and in the immediate vicinity of the telegraph and other public offices. The instrument-shelter is built upon the plan adopted by the central office in Washington, having double walls of lattice-work, double floor and triple roof to prevent the instrument from being affected by either the direct or the reflected heat of the sun. This shelter, or more properly speaking, observatory, was built by Mr. Holliday, a public-spirited citizen, who takes a lively interest in the development of the system of weather reports, and rented at a moderate rate to the department. The rain-gauge, vane, and anemometer are well exposed on the roof of the observatory.

The station was established by Sergeant Henry Fenton, and reports

commenced on the morning of June 1, 1871. Sergeant Fenton fitted up the station comfortably and well, but getting into a personal difficulty with the manager of the telegraph-office, it was thought advisable to transfer him to another station, and he was accordingly relieved September 10, by Sergeant T. L. Watson. Owing to the unhealthiness of the station, an assistant was sent there in August.

Reports are received from fifteen other stations. Three bulletins are posted regularly in the most public places, and both daily papers furnished with the reports and manifold maps issued each morning. The large weather-map is hung in the City National Bank, and changed each morning after the reception of reports.

Latitude of station	37° 00'
Longitude of station	89° 00'
Elevation of barometer above sea-level	400 feet.

The observer is provided with a full set of standard instruments, all of which are reported in good condition. There is an extra barometer at this station, the first one sent having been injured by the observer in moving his office from its original location on Commercial avenue. It has been repaired, and is now in good condition.

Amount of rent paid for office and observatory is \$25 per month.

CHARLESTON, SOUTH CAROLINA, (No. 21.)

The office is located at the corner of East Bay and Broad streets, in easy reach of the telegraph and newspaper offices, and principal business houses. The wind-vane, anemometer, and rain-gauge, are well exposed, and the instrument-shelter is of the usual model and well constructed.

The station was established by Sergeant J. E. Evans, and reports commenced on the morning of January 5, 1871, and have been continued regularly since that time, with the exception of the midnight reports from March 4 to May 24, during which time the telegraph-office closed at 10 p. m., and the reports were necessarily held over until next morning. Full reports are received from all other stations, and six daily bulletins are issued and posted in prominent places. The daily papers publish a portion of the afternoon and midnight reports, and the probabilities regularly. A large weather-map is hung in the rooms of the Chamber of Commerce, and the symbols changed each morning.

Latitude of station	32° 45'
Longitude of station	79 57
Elevation of barometer above sea-level	64 feet.

The station is supplied with a complete set of standard instruments, and all are reported to be in good condition. An assistant was sent from this office June 12, 1871, as the work was too great for one man to perform satisfactorily. Reports have been made regularly and properly, and the conduct of the observer has received the commendation of the meteorological committee of the chamber of commerce. Both observer and assistant have been attacked with yellow fever, and were unable for a few days to perform their duties, but they are now so far recovered as to dispense with the services of the citizen who made the reports during their illness.

This station has not been visited by an inspecting officer, owing to the prevalence of fever, and the only information had is derived from the reports of the observer and of the chairman of the meteorological committee.

The rent paid for office is \$10 per month.

CHEYENNE, WYOMING TERRITORY, (No. 68.)

The office at this station is located in the center of the business portion of the town, and in the immediate vicinity of the telegraph-offices. The roof of the building occupied is flat, and affords a good exposure for the vane, anemometer, and rain-gauge. The instrument-shelter is of the authorized pattern, with louver-boarded sides and front, and projects from a window of the office.

The station was established by Sergeant A. C. Dobbins, and reports commenced on the morning of November 1, 1870. Sergeant Dobbins still remains in charge and performs his duties alone, as only the reports of four other stations are received and one bulletin issued in the morning and afternoon of each day. The newspaper declines to publish anything but the local observations, and these very irregularly.

Latitude of station.....	41° 12'
Longitude of station.....	104 42
Elevation of barometer above sea-level	6,057 feet.

The observer is supplied with a full set of standard instruments, and reports them in good condition. All reports from this station have been correctly and promptly made, and the management of the station has been satisfactory.

The rent of office is \$15 per month.

CHICAGO, ILLINOIS, (No. 37.)

The observation office is located in the fourth story of a building on Washington street, one square from the city-hall, and on the same block as the chamber of commerce building, and consequently in the heart of the business portion of the city. It is convenient in size and location for the display of instruments and performance of official work. The roof of the building is flat and surrounded by a parapet, to clear which it was necessary to elevate the anemometer upon a framed support 18 feet in height. The wind-vane, being of the new model, was fairly exposed, and was made to indicate the direction in the office of the observer.

The instrument-shelter is of the standard pattern, and projects from one of the office windows facing due north. The station was established by Sergeant James Mackintosh, and reports commenced November 1, 1870, since which date there has been no serious interruption. Reports are received here from fifty-three other stations and are bulletined and furnished regularly to the press. Nine morning bulletins are issued and seven afternoon ones. The midnight report is furnished to the Times and Tribune, and is published regularly by them with the synopses and probabilities. The morning report is published in the Evening Post and Evening Journal. Seven manifold maps are issued at present, but a printing-press is now at the station, and when set up it is proposed to issue a much greater number. The large weather-map is hung up in the hall of the Chamber of Commerce, and its symbols are changed regularly.

This being the grand western center of the circuits over which weather reports are transmitted, the duty of making the necessary transfers from the several circuits has been an important one, and has been well performed through the assistance of the telegraph officials, who, from the general superintendent down, appear to have taken a lively personal interest in having the work well done.

The observer in charge has not been changed since the station was opened, but several changes of assistants have been made from various

causes. Sergeant A. B. Williams was first sent out as assistant in November, and remained until December 31, when he was transferred to the charge of the Du Luth station, and his place taken by the observer from that place. On the 1st of March this latter man was discharged for conduct that unfitted him for the performance of his duties, and Private Mason, of the signal detachment, took his place and remained until June 15, when he was removed, and the present assistant, Sergeant W. S. Kauffman, sent there, since which time there has been no difficulty. The reports have been regularly and promptly made during the whole year and the general management of the station satisfactory.

Latitude of station	41° 52'
Longitude of station	87° 35'
Elevation of barometer above sea-level	645 feet.

The observer is provided with a full set of standard instruments and reports them all in good condition. A meteorological committee has been appointed here by the board of trade.

The rent of office is \$18 per month.

NOTE.—Since writing the above, the building in which the office was located has been destroyed by fire, together with all the instruments and records of the station. A fresh supply of instruments and a new outfit throughout has been forwarded, and reports are again being received from the new office, which is temporarily located at No. 10 West Randolph street.

CINCINNATI, OHIO, (No. 65.)

The observer's office is located in Pike's Opera House building, and in close proximity to the telegraph and newspaper offices, &c. The high parapet by which the flat roof of the building is surrounded has rendered the construction of a platform necessary in order to get the proper exposure for the vane, anemometer, and rain-gauge. The agent of the building has declined to allow the large wind-vane to be erected without consulting the owners, so that at present the small one only is used. The instrument-shelter is of the standard pattern.

The station was established by Sergeant F. H. Fletcher, and reports commenced on the morning of November 1, 1870. Sergeant Fletcher remained in charge until June 22, when he was relieved by Sergeant F. B. Lloyd, who had been acting as his assistant since January 4, 1870. Sergeant James H. Garrard was sent out as assistant, and remained in that capacity until transferred to the charge of Nashville station, being succeeded in Cincinnati by a private from the school of instruction at Fort Whipple, Virginia.

Cincinnati receives the reports of fifty-three other stations, being on what is known as the Lake circuit. Seven bulletins are issued, the four leading dailies furnished with tabular report, and the several public libraries and reading-rooms, with the chamber of commerce and board of trade, are supplied daily with maps. A printing-press has been recently sent to this station, and the issue of maps commenced on a more extensive scale, but no detailed report has yet been made of the precise number. The daily newspapers all publish the latest synopsis received, and several of them give the full tabular report. The observer here prepared a monthly abstract of the local observations, which is printed in the leading papers, and gives much valuable meteorological information in concise shape.

Latitude of station	39° 06'
Longitude of station	84° 30'
Elevation of barometer above sea-level	656 feet.

The observer is supplied with a full set of standard instruments, all of which are reported to be in good condition. The chamber of commerce and the board of trade have each appointed a meteorological committee.

The rent of office is \$12 per month.

CLEVELAND, OHIO, (No. 34.)

The observer's office is located in the Atwater building, at the foot of Superior street, and is convenient to the telegraph-office and other public places. The vane, anemometer, and rain-gauge are placed on the roof of the building and properly exposed. The instrument-shelter is of the standard pattern.

The station was established by Sergeant Theodore Mosher, who still remains in charge, and reports were commenced on the morning of November 1, 1870. There has been an assistant at the station since February 6, 1871, and the management of the station has been satisfactory.

Reports are received from fifty-three other stations, and four morning and one evening bulletin issued. The daily papers were supplied for some time with the tabular report and published it, but have now discontinued it, and print only the synopsis and probabilities. Four manifold maps are issued daily, and the large weather-map is changed regularly.

Latitude of station.....	41° 30'
Longitude of station.....	81° 36'
Elevation of the barometer above sea-level.....	671 feet.

The observer is provided with a complete set of standard instruments, all of which he reports in good condition. A meteorological committee has been appointed by the board of trade.

The rent of office is \$12 per month.

CORINNE, UTAH, (No. 70.)

The observer's office is located on Montana street, and is convenient to the telegraph-offices of both the Western Union and Atlantic and Pacific companies. The rain-gauge, anemometer, and wind-vane are exposed on the roof of the building—the latter instrument being the old or small pattern first adopted. It will be replaced soon by a large one. The instrument-shelter is of the standard pattern.

The station was established by Sergeant William McElroy, and reports commenced February 2, 1871. No change has been made at this station either in the observer or location of office. The reports from four other stations are received, and one bulletin of each report properly made out and posted at the observer's office.

The local observations were given in the newspaper published at the station until the printing-office was removed. All official reports have been promptly made by the observer, and his duties performed in a satisfactory manner so far as can be judged without a personal inspection. There is no assistant at this station.

Latitude of station.....	41° 30'
Longitude of station.....	112° 18'
Elevation of barometer above sea-level.....	4,308 feet.

The observer is supplied with a complete set of standard instruments, all of which are reported to be in good condition.

Rent of office is \$18 per month.

DAVENPORT, IOWA, (No. 51.)

The observer's office is located on the corner of Main and Second streets, in the First National Bank building, and in the immediate vicinity of the telegraph and newspaper offices. The roof affords a good exposure for the wind-vane, anemometer, and rain-gauge. The instrument-shelter is of the standard pattern.

The station was established by Sergeant George H. Richmond, and reports commenced May 24, 1871, since which time they have been regularly made. Being on the long circuit from Chicago to San Francisco, the reports passing over that circuit were, at first, all that were received at this station, but on the application of the leading citizens, the number has been increased to twenty-three. This increased the work of the observer to such an extent that it was found necessary to furnish him with an assistant, which was done July 24, 1871.

Eight daily bulletins are posted in public places and the large weather-map regularly changed. Manifold maps are not issued.

Latitude of station.....	41° 30'
Longitude of station.....	90° 36'
Elevation of barometer above sea-level.....	645 feet.

The observer is provided with a full set of standard instruments, and he reports them all in good condition.

The board of trade has reported a meteorological committee.

The rent paid for the office is ——— per month.

DETROIT, MICHIGAN, (No. 36.)

The observer's office is located in the third story of the Bank Block, corner of Griswold and Congress streets, and in close proximity to the telegraph and post offices and the offices of the daily newspapers, and the location is pronounced by the inspecting officers as good a one as could have been selected. The instrument-shelter consists of an observatory, built after the plan of the one used at the central office in Washington, and on the roof of this the rain-gauge and anemometer are placed. The wind-vane, large model, is attached to the roof of the main building and is well exposed.

The station was established by Sergeant Allen Buell, and reports commenced on the morning of November 1, 1871, and have been made continuously since that date. Reports are received from fifty-three other stations; twenty-two bulletins are made out and posted of each morning report, fifteen of the afternoon report, and three of the midnight report. Four daily papers, three morning and one afternoon, are supplied with and publish the tabular report and synopsis. In addition to this, the observer issues a manifold map with each bulletin, and changes daily the large weather-map which is hung in the board of trade building.

The enterprise and energy of the observer at this station has won for him the commendation of the meteorological committee, and deserves especial mention here. There has been an assistant at the station since February 6, 1871. Private Graham, of the signal detachment at Fort Whipple, was first sent out, and remained until August 14, when he was put in arrest for disorderly conduct, and is now awaiting, at Fort Wayne, Michigan, the action of a court-martial. Private McGovern was sent out to replace him, and is giving satisfaction.

Latitude of station.....	42° 18'
Longitude of station.....	83° 0'
Elevation of barometer above sea-level.....	656 feet.

The observer is supplied with a full set of standard instruments, all of which he reports in good condition.

There is a meteorological committee, appointed by the board of trade, at this station.

Rent of office per month, \$18.

DU LUTH, MINNESOTA, (No. 40.)

The observer's office is located in the upper story of Edmunds's Block, on Superior street, near the business center of the town, and in the immediate vicinity of the telegraph-office, post-office, and board of trade building. The wind-vane, anemometer, and rain-gauge are placed on the roof of the building, and the former indicates in the office the direction of the wind. The exposure on the southern and eastern sides is good, but a range of hills shuts off the wind from the north and west. The instrument-shelter is of the standard pattern, and projects from a window of the office.

The station was established by Sergeant A. W. Cox, and reports commenced on the morning of November 1, 1870. Sergeant Cox was relieved January 1 by Sergeant A. B. Williams, who continues in charge. The reports of ten stations are received here, and four morning and three afternoon bulletins issued and properly posted. The three newspapers are furnished with the reports, and two of them publish a weekly statement of the observations. The daily paper does not give the tabular reports, but is making arrangements to do so soon. The large weather-map is hung in the board of trade room and properly changed. The reports are not received with regularity, owing to want of proper telegraphic facilities, and this difficulty cannot be overcome until the increase in population and business justifies the putting up of additional wires.

Latitude of station.....	46° 48'
Longitude of station.....	92° 06'
Elevation of barometer above sea-level.....	660 feet.

The station is supplied with a full set of standard instruments, all of which are in good condition.

A meteorological committee of the board of trade has been appointed at the station.

The rent of office is \$20 per month.

ESCANABA, MICHIGAN, (No. 49.)

The observer's office is located on the second floor of a three-story building in Tilden street, and is near the business center of the town, and has been selected with good judgment. The wind-vane and anemometer are on the roof of the building, and the rain-gauge on the ground, with its top one foot above the surface of the earth. The instrument-shelter is of the standard pattern, and projects from a window of the office.

The station was established by Sergeant John N. Martin, and reports commenced on the morning of May 24, 1871. There has been much irregularity in the transmission of the reports to and from this station, owing to the imperfect working of the telegraph line. The observer has been regular in making his observations, and in filing them at the proper hours.

The reports from eleven other stations are received here, and four morning and the same number of afternoon bulletins issued and posted

in public places. The only paper published in Escanaba is a weekly one, and it gives a summary of the most important points in the week's reports. There is no large weather-map at this station, and no manifold maps are issued. There is no assistant here, as the labor can be easily performed by one man when in good health.

Latitude of station.....	46° 36'
Longitude of station.....	87° 06'
Elevation of barometer above sea-level.....	603 feet.

The observer is supplied with a full set of standard instruments, all of which are reported to be in good condition. The station has been visited by an inspecting officer, and its general management pronounced satisfactory. There is no board of trade at this station, and its principal importance to this office is the meteorological value of its reports in connection with the weather on the lakes.

A monthly rental of \$14 is paid for the office.

GALVESTON, TEXAS, (No. 55.)

The observer's office is at No. 67 Strand, and is well located for the convenience of the business portion of the community and for ready access to the telegraph-office. The vane, anemometer, and rain-gauge are located on the roof of the building, and well exposed. The instrument-shelter is of the standard pattern, and is built out from a window of the office.

The station was established by Sergeant William Von Hake, and reports commenced on the morning of April 19, 1871. There being but a single wire between New Orleans and Galveston, telegraphic communication has been frequently interrupted, and the reports delayed in consequence. The station receives the reports of eighteen other stations, and the work was so exhaustive in that hot climate that an assistant was sent out there on the 18th of August, arriving in time to prevent a break in the reports, as the health of Sergeant Von Hake had been gradually failing; and although he kept at work as long as he was able to get about, he was finally forced to stop. Up to the present time he has been unable to resume work, and the assistant, a thoroughly competent man, has performed all the station duties.

Six bulletins a day are posted, and two papers furnished with the reports.

Much interest is manifested in the reports by the citizens, and if the telegraph were in good working order, so that their reception could be relied upon, they would prove of much service to the shipping at this point.

Latitude of station.....	29° 19'
Longitude of station.....	94° 46'
Elevation of barometer above sea-level.....	50 feet.

The observer is supplied with a complete set of standard instruments, and reports them as being all in good condition. Some doubt was expressed at one time as to the accuracy of his thermometric reports, but a careful series of comparative readings established their correctness.

A meteorological committee has been appointed by the board of trade, and its members have manifested a lively interest in the success and accuracy of the reports. There are no manifold-maps issued here, but a large weather-map is hung up, and changed properly and regularly.

The rent paid for office is \$25 per month; is higher than the amount paid in much larger places at the North, but as low as a suitable one

could be obtained, even with the assistance of the meteorological committee.

GRAND HAVEN, MICHIGAN, (No. 48.)

The observer's office is located at the corner of Second and Washington streets, in the business center of the town. The post-office and custom-house are in the same block, and the telegraph office only one square distant. A line of hills on the west and southwest cut off the important winds in that direction, and this fact will require a change of location to a better exposed one as soon as the necessary facilities can be had. The vane, anemometer, and rain-gauge are all on the roof of the building in which the office is situated, and are as well exposed as the location will permit. No instrument-shelter was used at the station until the inspecting officer ordered one made of the standard pattern when there in the early part of September, 1871.

The station was established by Sergeant F. F. Wood, and reports commenced May 24, 1871, and have been regularly made since that time. The reports of nine of the principal lake-stations are received here, and four morning and three afternoon bulletins issued. Three weekly papers are furnished with and publish an abstract of the local reports and the most important features of the others. No manifold-maps are issued, and there is no large weather-map at the station.

Latitude of station.....	43° 07'
Longitude of station.....	86° 13'
Elevation of barometer above sea-level.....	599 feet.

The station is provided with a full set of standard instruments, all of which are reported to be in good condition.

There is no board of trade here, and no assistant.

Eight dollars per month is paid for rent of office.

INDIANAPOLIS, INDIANA, (No. 43.)

The office is located at the corner of Meridian and Washington streets, and convenient to the telegraph and principal newspaper offices. The instruments are well exposed, and the observations accurately made and reported regularly by Sergeant C. F. R. Wappenhaus, who established the station, and commenced sending telegraphic reports February 10, 1871, since which time there has been no interruption nor any change in location of office.

Indianapolis receives the reports of thirty other stations. Four bulletins are posted in conspicuous places, and all the daily papers furnished with the press-report, but they do not publish it regularly. An assistant was sent to the station August 22. Manifold-maps are not issued.

Latitude of station.....	39° 42'
Longitude of station.....	86° 09'
Elevation of barometer above sea-level.....	748 feet.

The station is supplied with a complete set of standard instruments, all of which are reported to be in good condition.

The board of trade has appointed a meteorological committee, and its members have displayed much interest in the development of the system.

Rent paid for office is \$7 per month.

JACKSONVILLE, FLORIDA, (No. 73.)

The observer's office is located in the Freedmen's Bank building, at the corner of Forsyth and Pine streets, and is in the center of the busi-

ness part of the city, and within a short distance of the telegraph-office. The office room is on the second floor, but the vane, anemometer, and rain-gauge are on the roof of the building, and have a good exposure. The instrument-shelter is of the standard pattern, and projects from a window of the office in the usual manner.

The station was established by Sergeant D. A. Daboll, and reports were commenced on September 11, 1871, the arrival of the observer having been delayed somewhat by the quarantine regulations established to protect the city from being affected by the yellow fever, then prevalent at Charleston and other seaport towns.

Nine stations send their reports to Jacksonville, and these reports are bulletined and given to the press, but no report has yet been made to the office of the precise number of bulletins issued, and their location.

Latitude of station.....	30° 15'
Longitude of station.....	82° 00'
Elevation of barometer above sea-level.....	50 feet.

The station is provided with the regular outfit of standard instruments, and all of them are reported in good condition.

The office has no knowledge of the appointment of a meteorological committee by the board of trade, nor of the existence of such a body as a board of trade. The reports are made regularly and properly.

Rent paid for the office is \$18 per month.

The station has not yet been visited by an inspecting officer.

KEOKUK, IOWA, (No. 47.)

The office at this station is located at the corner of Main and Second streets, and in the immediate vicinity of the principal business houses. The wind-vane, anemometer, and rain-gauge are exposed upon the roof of the building, and secured to a platform built for the purpose. The instrument-shelter is of the standard pattern, and projects from a window of the office.

Reports are received from twenty-six other stations, and are bulletined in the most important public places. No inspection has yet been made of the station, and the details for a satisfactory report are wanting. The daily papers are supplied with the press-report, and the observer is a competent and reliable man, and has a good assistant, who has been with him since August 4, 1871.

The station was established by Sergeant A. C. Barclay, and reports commenced on the morning of July 15, 1871, and have been continued, with very few interruptions, since that date.

Latitude of station.....	40° 18'
Longitude of station.....	91° 30'
Elevation of barometer above sea-level.....	580 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition. Manifold-maps are not issued here, but the large weather-map is displayed, and its symbols changed regularly.

The amount of rent paid per month for office is \$6.

KEY WEST, FLORIDA, (No. 25.)

This station was established by Sergeant John R. Allen, and reports commenced November 1, 1870. Until September 10, 1871, there was no regular transmission of reports to Key West, but since that time those

of nine other stations have been sent and regularly bulletined in four public places. The reports from this station have been frequently interrupted by telegraphic irregularities, but the work of the observer has been faithfully and well done, and his mail reports regularly and properly rendered.

Latitude of station.....	24° 36'
Longitude of station.....	81° 48'
Elevation of barometer above sea-level.....	20 feet.

The station is supplied with the regular outfit of standard instruments, and they are all reported to be in good condition.

The amount of rent paid for office, \$15 per month.

(Since writing the above, news has been received of the death of Sergeant Allen, on the 12th of October, of yellow fever. This leaves the station without a regular observer, but a civilian, who had been instructed by Sergeant Allen, is making reports, and has not lost a single one to date.)

KNOXVILLE, TENNESSEE, (No. 42.)

The observer's office at this station is located in the university building, and is at a distance from the business part of the city, but as this is merely a reporting station, there appears to be no good reason for changing the locality. The instruments are well exposed, and the large vane is made to indicate the direction of the wind on the ceiling of the office.

The station was established by Sergeant John K. Payne, professor of mathematics in the university, and reports commenced January 20, 1871, since which date they have been made without interruption. The only reports received here are those from Lynchburgh, Virginia, and consequently there are no bulletins posted nor maps issued. The daily papers are furnished with all the local observations, and insert them regularly.

Latitude of station.....	35° 56'
Longitude of station.....	83° 58'
Elevation of barometer above sea-level.....	1, 007 feet.

The station is supplied with a full set of standard instruments, all of which are reported to be in good condition. The first barometer for this station was sent by express carefully packed, but was broken in transit, and another was sent in charge of the postal route-agent, through the kindness of the Post Office Department, and this was received in good order. The management of the station has been quite satisfactory, and all reports made properly and promptly.

Office rent is \$15 per month.

LAKE CITY, FLORIDA, (No. 24.)

The office is located on the corner of Main and Franklin streets, about one-fourth of a mile from the telegraph office, railroad depot, and post-office. The building is the best in town for the purpose, being isolated from others and from high trees. It has a sloping roof, and the wind-vane, anemometer, and rain-gauge are erected upon a platform 8 feet square, built upon the ridges of the roof. The vane registers in the office. The instrument-shelter is of the standard pattern, and projects from a window in the usual manner.

The station was established by Sergeant A. C. Barclay, and reports commenced November 1, 1870. Sergeant Barclay was transferred on

the 23d of June to another station, and was succeeded by Sergeant J. E. Magruder, and on the 25th of September an assistant was sent to the station.

The reports of ten other stations are received here, and are transferred to the Key West and Jacksonville circuits. Full reports were received until July of this year, when they were discontinued, as being useless to the citizens and causing extra and unnecessary work to the observer. No bulletins are posted at present, and the inspecting officer reports that they would be of no use. The station was established more to facilitate and ensure the transfer of the reports to and from Key West and other stations from one telegraph line to the other, the Western Union and Inter-Ocean lines connecting here, but occupying offices some distance apart.

Latitude of station.....	30° 06'
Longitude of station.....	82° 42'
Elevation of barometer above sea-level.....	190 feet.

The station is supplied with a full set of standard instruments, all of which are in good condition.

The rent paid for office is \$10 per month.

The following extract from the report of the inspecting officer shows that a portion, at least, of the inhabitants fail to appreciate properly the labors of the observer:

Indignation meetings have been held, and resolutions passed, to drive him (the observer) from the town, because it was believed that his instruments caused the unexampled bad weather and large amount of rain which has fallen here lately.

As the work of transferring reports at this point can and should be performed by the telegraph companies, there is no necessity for maintaining the station, and its removal to some other point is recommended.

LEAVENWORTH, KANSAS, (No. 52.)

The office of the observer at this station is located on Delaware street, and within easy reach of the several public offices. It is in the upper story of the building, and the roof is used for the exposure of the wind-vane, anemometer, and rain-gauge. The shelter projects from the window of the office and is built after the standard model.

The station was established by Sergeant George H. Bochmer and reports commenced on the 24th of May, 1871. Telegraphic communication with this station has been regular, and reports have been uninterrupted. The reports of fourteen other stations are received here, and seven bulletins are issued and properly posted, and all the daily papers are supplied with and publish full tabular reports.

Latitude of station.....	39° 21'
Longitude of station.....	94° 44'
Elevation of barometer above sea-level.....	929 feet.

The observer is supplied with a complete set of standard instruments, all of which he reports to be in good condition. Manifold-maps are not issued. The station has been conducted in a satisfactory manner, and the reports have been properly and promptly made.

Rent paid for office is \$14 per month.

LOUISVILLE, KENTUCKY, (No. 64.)

The observer's office is temporarily located in the custom-house, and it is hoped that arrangements will be made to retain it here permanently.

The vane, anemometer, and rain-gauge are exposed on the roof of the building, and the other instruments in the office, no shelter having yet been built.

The station was established by Sergeant Thomas J. Brown, and reports commenced September 11, 1871. Thirty reports are received, and bulletins are issued daily. The daily newspapers are all supplied with and print the tabular reports as well as the synopsis and probabilities. No maps are issued.

Latitude of station.....	38° 00
Longitude of station	85° 25
Elevation of barometer above sea-level	493½ feet

The station is provided with a full set of standard instruments, all of which are reported to be in good condition. The reports are made properly and promptly, and the management of the station is satisfactory so far as known. It has not been visited by an inspecting officer.

No rent is paid at present for office.

LYNCHBURGH, VIRGINIA, (No. 44.)

The office of the observer is located at the corner of Eighth and Court streets, and the exposure of the wind-vane, anemometer, and rain-gauge on the roof is a good one. The shelter is of the standard pattern, and projects from a north window of the office.

The station was established by Sergeant James B. Murray, and reports commenced May 24, 1871. The schedule reports received are those of Knoxville only, but, through the courtesy of the Western Union Telegraph Company, twenty additional reports are sent each morning, and bulletined properly. There is no assistant at this station, and no manifold-maps are issued.

Latitude of station.....	37° 18
Longitude of station	85° 54
Elevation of barometer above sea-level	650 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition. The reports have been made with regularity and promptness, and the general management of the station satisfactory. It has not yet been visited by an inspecting officer.

Rent paid for office is \$11 per month.

MARQUETTE, MICHIGAN, (No. 50.)

The office at this station is located at the corner of Spring and Front streets, in the upper story of the building, and in the immediate vicinity of the post-office and telegraph office and the custom-house, and is favorably situated for the convenience of the business portion of the town. A low range of hills extends along the lake shore, and partly cuts off the wind from the west and south, but this cannot be remedied without sacrificing the advantages to be derived from close proximity to the telegraph-office. The anemometer and vane are on a platform built upon the roof for the purpose of giving them the necessary exposure. The rain-gauge is on the roof of the building and well placed. The instrument-shelter is of the standard pattern, and projects from an office window.

The station was established by Sergeant Thomas P. Stout, and reports commenced on the 11th of May, 1871. The same difficulty is experienced

here that was referred to in the report upon the Esconawba station, in reference to the reception and transmission of reports, owing to the frequent interruption of telegraphic communication with Milwaukee. The reports of eleven other stations, principally along the lakes, are received here, but so irregularly as to be of little actual value. Fourteen morning bulletins are issued, and nine of the afternoon reports. One paper only, and that a weekly, is published here, and it prints a synopsis of all received since last issue.

Latitude of station.....	46° 33'
Longitude of station	87° 23'
Elevation of barometer above sea-level.....	668 feet.

The station is supplied with a full set of standard instruments, all of which are reported in good condition.

The rent of office is \$12 50 per month.

The reports from this station are properly made, and the sergeant proved himself a hard-working man, but his personal conduct was found to be such that the inspecting officer, when he visited the station in the latter part of September, recommended his relief, and he was accordingly replaced by Sergeant Clendenon.

MILWAUKEE, WISCONSIN, (No. 38.)

The office at this station is located in the third story of the Northwestern Insurance building, on Broadway, in the heart of the business part of the city. The vane, anemometer, and rain-gauge are on the roof of the building, and the instrument-shelter is also on the roof, built from the cover of a hatchway. It is a modification of the standard pattern, and answers the purpose well.

The station was established by Sergeant A. Brimer, and reports commenced November 1, 1870, since which time there has been no serious interruption. The station receives fifty-three reports, and four bulletins of both the afternoon and morning reports are issued. Three morning reports are supplied with the midnight report, and one evening paper with the morning. Seven manifold-maps are issued daily, and the large weather-map, which is hung in the hall of the chamber of commerce, is changed regularly. An assistant, Private Gilligan, of the signal detachment, was sent to this station on the 17th of July, 1871, and remained until September 9, 1871, when he was relieved for misconduct, and succeeded by another man equally as bad, who, after a few days' trial, was called in, and still another one sent. This latter man is doing well.

Latitude of station.....	43° 03'
Longitude of station	87° 57'
Elevation of barometer above sea-level	641 feet.

A full set of standard instruments is in use at this station, and all of them are reported to be in good condition.

There has been a meteorological committee appointed by the chamber of commerce.

The management of the station has been satisfactory, and reports have been regularly made, and, it is believed, in a reliable form. It was inspected in September, and found in good order. This is the transfer-point for all reports going to and from the Northwestern States, and this fact increases the amount of labor required of the observer.

The office rent is \$20 per month.

MOBILE, ALABAMA, (No. 27.)

The office of the observer is located on St. Michael street, and convenient to the telegraph-office. The instrument-shelter is made after the standard pattern.

The station was established by Sergeant A. R. Thornett, and reports commenced November 7, 1870, since which time there has been no serious interruption. Eleven reports are received here, and four bulletins issued daily. In addition to this, three daily papers are supplied with the reports, and publish the afternoon ones, not caring to take the midnight reports on account of the lateness of the hour at which they arrive. An assistant, Private William Line, was sent to the station May 18, 1871, and has shown himself to be a steady, reliable man.

Latitude of station.....	30° 42'
Longitude of station	87° 59'
Elevation of barometer above sea-level	50 feet.

A full set of standard instruments has been sent to this station, and they are all reported to be in good condition.

A meteorological committee has been appointed by the board of trade, and the management of the station has been satisfactory.

The office rent paid is \$12 per month.

MONTREAL, CANADA, (No. 56.)

The observations at this station are made by Dr. Charles Smallwood, of the Montreal Observatory, who exchanges with this office, sending his own reports regularly except on Sundays, and receiving in return as many reports as he chooses to select from the number received at Portland. The instruments used are those belonging to the observatory. Reports are made weekly to this office, by Dr. Smallwood, on the regular forms, and those sent by telegraph are made out in precisely the same manner as those at all other reporting stations.

MEMPHIS, TENNESSEE, (No. 62.)

The office at this station was originally located in an unsuitable portion of the city, as the observer could not procure a room in the business quarter without paying higher rent than his instructions authorized. On the 1st of September a room was obtained, and the office moved to Second street. The exposure of instruments on the roof is reported to be good, and the shelter of the standard pattern.

The station was established by Sergeant Thomas J. Brown, and reports commenced February 28, 1871, since which time they have been regularly made. On the 28th of August, 1871, Sergeant Brown was transferred to another station, and was succeeded by Sergeant S. W. Rhode, who remains in charge, and is assisted by Private Hugh Coyle. Thirty reports are received here, and seven bulletins issued daily; and, in addition to this, the daily papers are furnished with the full local report, which is the only one they will publish. All the papers publish the latest synopsis received up to the time of going to press. Manifold-maps are not issued.

Latitude of station.....	35° 08'
Longitude of station.....	88° 00'
Elevation of barometer above sea-level.....	286 feet.

The station is supplied with a full set of standard instruments, all of which are reported to be in good condition.

The chamber of commerce has appointed a meteorological committee, and the observer reports that its members have manifested considerable interest in his labors. Both sergeants who have been in charge of the station have given satisfaction, and made all reports regularly and promptly.

The office rent was \$15 per month to September 1, since which time it has been \$16 50.

MONTGOMERY, ALABAMA, (No. 26.)

The office was well located, and the instruments properly exposed by Sergeant J. E. Evans, who commenced reporting November 1, 1870. When it was decided to occupy the coast stations, Montgomery was abandoned, and the observer transferred to Charleston, South Carolina. Reports were discontinued December 18, 1870.

MT. WASHINGTON, NEW HAMPSHIRE, (No. 46.)

The observer's office is located in the depot building of the Mount Washington Railroad, through the kind permission of the officers of the company. The instruments used are of the standard patterns, and are duplicated to prevent any interruption of reports through the accidental breakage of any of them. Spirit-thermometers, prepared especially for the station, are supplied to the observer, the experience of last winter having shown the necessity of getting instruments that were graduated for unusual low temperatures.

In the fall of 1870 an expedition was organized by Professor Hitchcock, of Dartmouth College, for the occupation, during the winter, of the mountain as a meteorological station, and efforts were made by him to raise sufficient means to defray the expenses from private sources, but being unsuccessful, he applied to this office for a telegraph cable and the necessary instruments to work it. Reports from such an elevated position were considered important, and three miles of Kerite covered wire and a complete set of telegraph instruments and an operator were sent to assist the professor in carrying out his enterprise. The operator was also an instructed observer, and some delay was experienced in getting him ready, and the cable was laid before his arrival, by Professors Hitchcock and Huntington, upon the trestle-work of the railway, and fastened by eyelets to prevent its being swayed by the wind and the insulation destroyed.

Sergeant Theodore Smith, the observer sent to take charge of the station, reached the mountain in December, and his first duty was to insure telegraphic communication with Littleton, the nearest station, by a personal inspection of the main line. He found this line in a bad condition, it being broken in several places, and blown off the poles on many exposed points along the road. The winter had set in, and a continuous snow-storm for several days and an almost impassable road made the labor of repairing a severe one, and it was not until the 12th of December that communication was had over the main wire from the base of the mountain with Littleton. The line to the summit was still imperfect, as the several pieces of cable, although securely laid, were not spliced together at the ends, this labor having been left for more experienced hands than those which laid the wire. The difficulty of the task can be imagined when it is considered that the depth of snow along the line varied from 10 to 20 feet, and the precise localities where the

splices were to be made were unknown, as the boards originally put up as guides were quite covered up by the snow. In spite of these obstacles, the work was performed in less than two days, and a ground connection having been secured by running the suspended wire of the main line into the Ammonoosuc River, at the base of the mountain, communication was complete with the office in Washington, and on the morning of December 15 regular weather-reports were commenced, and transmitted, after that date, as regularly as circumstances would permit. Violent storms of wind frequently broke the cable, and the difficulty of repairing these breaks when the temperature was below zero from 10° to 40° can be better imagined than described. As the trestle-work is in some places 30 feet high, the work was not without danger, and Sergeant Smith at one time met with a serious accident, from the effects of which he still suffers. The Kerite wire proved itself a good and reliable conductor, and the greater portion of that used last winter has been relaid for use again the present season. One mile of Bishop's covered wire has been added to the Kerite, above the line of vegetation. Sergeant Smith was relieved May 22, on account of ill health, and was succeeded by Sergeant Martin L. Hearne, who will remain during the present winter, assisted by Private Stevens, of the signal detachment, and the work will be wholly under the control of this office.

- The faithfulness and devotion to duty manifested by Sergeant Smith, during the time he was in charge of the station, entitle him to the commendation of his superior officer, as they have won for him the respect of all students of meteoric science in the country.

As the office has profited by past experience, and supplied the station with the best attainable instruments, it is hoped that more reliable data will be collected during the ensuing winter than was possible last winter under the circumstances. The cost of maintaining the station greatly exceeds that of stations at more accessible points. Efforts have been made by the office to obtain permission to erect a building for permanent use as an observatory, but so far they have been unsuccessful, owing to the ownership of the summit being the subject of litigation, and the consequent difficulty of getting a title.

NASHVILLE, TENNESSEE, (No. 63.)

The office was at first located on Cherry street, but was soon afterward removed to College street, where it now remains. The vane, anemometer, and rain-gauge are well exposed on the roof of the building, and the instrument-shelter, of the standard pattern, projects from a window in the usual manner.

The station was established by Sergeant George H. Witmer, and reports commenced on the morning of November —, since which time they have been sent regularly. Sergeant Witmer was relieved, on account of drunkenness, January 31, 1871, and was succeeded by Sergeant W. Moore, who was relieved, for the same cause, February 10, 1871. by Sergeant Thomas L. Watson, who remained in charge of the station until August 4, 1871, when he was relieved for failing to transmit his mail reports promptly. Sergeant J. H. Garrard is now in charge, and gives satisfaction. He is assisted by Private William Henderson, who was sent to the station July 6, 1871. Thirty reports are received here, and five bulletins issued daily. The newspapers publish nothing but the local reports and the probabilities. Manifold-maps are not issued.

Latitude of station.....	36° 10'
Longitude of station.....	86° 49'
Elevation of barometer above sea-level.....	532 feet.

The station is supplied with a full set of standard instruments, all of which are reported to be in good condition. The board of trade has appointed a meteorological committee to confer with the Chief Signal Officer whenever necessary.

Rent paid for office is at the rate of \$200 per annum.

Since the station has been in charge of the present observer, all reports have been regularly and properly made.

NEW LONDON, CONNECTICUT, (No. 14.)

The office is located on the second floor of a four-story building on Water street, within one square of the business center of the city, and within half that distance of the Western Union telegraph-office. Although not in the highest part of the city, the location is pronounced a good one by the inspecting officer. The wind-vane, anemometer, and rain-gauge are exposed on the roof of the building upon a cross-armed support about 6 feet in height. The instrument-shelter is of the standard pattern, and projects from a window on the fourth or upper story of the building. The station was established by Sergeant C. E. Bunsmade, and reports commenced January 15, 1871, since which time they have been received without serious interruption. Full reports from all other stations are received here, and six bulletins issued and posted daily, and two papers supplied with the press-report, one of the papers being published in Norwich, and the copy sent each night by train. Manifold-maps are not issued. The large weather-map is hung in the post-office, and corrected daily.

Latitude of station.....	41° 22'
Longitude of station.....	72° 9'
Elevation of barometer above sea-level.....	21 feet.

The station is supplied with a complete set of standard instruments, all of which are reported to be in good condition. The board of trade have appointed a meteorological committee, the members of which, and the citizens generally, display a lively interest in the reports.

The rent paid for office is \$12 per month. All reports have been made promptly, and the management of the station has been satisfactory. Private John Healy was sent here as assistant June 15, 1871.

NEW ORLEANS, LOUISIANA, (No. 28.)

The office is situated on the third floor of building, No. 222 Custom-house street, at a considerable distance from the telegraph and newspaper offices. Arrangements have been made to remove it to the custom-house as soon as a suitable room can be prepared, and then the location will be the best in the city. The office was moved, soon after the station was opened, from Carondelet street to its present location.

The wind-vane, anemometer, and rain-gauge have been exposed on the roof of the building, and the other instruments in the usual manner. The station was established by Sergeant D. S. Pullen, and reports were commenced November 1, 1870. Private J. C. McCoy was sent here as assistant May 18, 1871, and both men have performed their duties in a satisfactory manner. The reports of thirty other stations are received, and bulletined in the most prominent places in the city, and all the daily papers are furnished with the press-report, but only print selections from it, and that irregularly. The synopsis is received and published regularly.

A printing-press has recently been sent to this station, and the issue

of printed weather-maps has commenced, but no report has yet been made of the number distributed daily.

Latitude of station.....	29° 57'
Longitude of station.....	90° 00'
Elevation of barometer above sea-level.....	47 feet.

The station is supplied with a full set of standard instruments, all of which are reported in a good condition.

Ten dollars per month has been paid for rent of office.

This being a transfer-station for reports passing between Augusta, Galveston, and Shreveport, the observer is required to attend closely to his work. There have been some irregularities in the telegraphic work of the station, but these are being corrected, and it is believed that there will be no serious ground for complaint in the future.

NEW YORK, NEW YORK, (No. 15.)

The office was located on Wall street until removed to the Equitable Insurance building, on Broadway, July 25, 1871. The location of the building is a good one, and the advantage to be derived from the use of its elevated roof superior perhaps to any that can be had in the city, but the office occupied by the observers, and in which their duties are necessarily performed, is entirely unsuitable for the purpose, owing to the want of room.

The following extract from the report of the inspecting office shows the result of the want of space :

The observer's duties cannot be properly performed in this office, and they have not been, for, on account of a lack of sufficient space for two persons to write at the same time, the records have not been kept up.

This is the more to be regretted because the station is one of the most important in the country, and its shipping interests the greatest. The instrument-shelter is an iron copy of the observatory on the central office in Washington, and is sufficiently elevated from the roof to guard against the effects of radiation from the flat roof of the building.

The wind-vane, anemometer, and rain-gauge are fixed upon the roof of the observatory, and the two first-named instruments are made to register inside, the former by a shaft running into the building, and the latter by means of electricity. Two large flag-staffs, for the display of signals, have been erected upon the roof of the main building, and are in full view of a greater part of the harbor. If the office-room was suitable, the station would reflect credit upon the city, but as it now stands, few people ever visit it, and those seldom make a second visit.

The station was established by Sergeant C. R. Estabrook, and reports commenced on the morning of November 1, 1870, since which date there has been no interruption. Reports from the east, west, and south are here transferred and interchanged, and the routine work is exacting and laborious. Sergeant C. R. Daw was ordered here, as assistant, November 15, 1870, and remained until transferred to the charge of Philadelphia station, April 19, 1871, when he was succeeded by Sergeant A. W. Eastlake, who still remains. Full reports from all stations are received, fourteen bulletins of the and morning, and six of the evening reports are issued and distributed. Five papers are supplied with the morning report, and seven with the midnight one, although it is not published regularly by all of them. Nearly all the dailies in the city publish the synopsis.

The station is supplied with a printing-press for maps. Eighteen of these are issued per day, and properly distributed. This number has

temporarily increased, during the last ten days of September, to three hundred per day, but it is not proposed to continue such a large issue, unless to supply the popular demand. The large weather-map is hung in the Merchants' Exchange, and properly corrected.

Latitude of station 40° 42'
 Longitude of station 74° 01'
 Elevation of barometer above sea-level 128 feet.

The station is supplied with a full set of instruments, and all of them are reported to be in good condition. The chamber of commerce and board of underwriters have both appointed meteorological committees, which have rendered material aid to the office and to the observer.

No rent has been paid for the office since its establishment.

The sergeant in charge has made his reports regularly to this office, but until a larger office-room is obtained the station cannot be worked satisfactorily. The size of the city renders it impossible for the present force to distribute a sufficient number of bulletins in time to make them of value, and it is recommended that if the present system of publication is continued, one or two boys be employed to give a wider circulation to the morning reports.

NORFOLK, VIRGINIA, (No. 30.)

The office at this station is located on the fourth floor of a building on the corner of Main and Gray streets, two blocks from the wharves, custom-house and board of trade rooms, and the offices of the telegraph companies, and one block from the newspaper offices and the business part of the city. The location is pronounced a good one by the inspecting officer. The anemometer, vane, and rain-gauge are exposed on the roof of the building. The instrument-shelter is of the standard pattern, and projects from an office window in the usual manner.

The station was established by Sergeant W. E. Smith, and reports commenced January 1, 1871, and there has been no serious interruption since that date. An assistant was ordered to the station June 5, 1871, as the work was too laborious for one man. Full reports are received here, and four bulletins issued daily, besides eight manifold maps. Three papers are regularly furnished with the press-report.

Latitude of station 36° 51'
 Longitude of station 76° 19'
 Elevation of barometer above sea-level 54 feet.

The station is supplied with a full set of instruments, and all of them are reported in good condition. One barometer was broken by the observer in attempting to clean it, but another was immediately sent him, and very few barometric observations were lost.

Up to the 1st of September, 1871, the office was located in the custom-house, and no rent was paid; but, the location being considered undesirable, it was removed on that date, and rent is now paid at the rate of \$200 per year.

Reports have been regularly made by the observer, and his management of the station has been satisfactory, while his personal conduct is commended by the members of the board of trade and by the inspecting officers.

OMAHA, NEBRASKA, (No. 67.)

The office at this station is located in the upper story of a bank building on Farnam street, within easy reach of the telegraph, newspaper, and post offices. The vane, anemometer, and rain-gauge are

fixed on the roof of the building, which is flat, and well adapted to the purpose, and the exposure is as good as can be had at any available point in the city. A low range of hills partially cuts off the wind from the west, but does not offer material obstruction.

The shelter here is a modification of the standard pattern, and is built out from a window, as at other stations.

Sergeant W. W. Craig established the station, and commenced sending reports November 1, 1870, but was relieved November 9, on account of gross irregularities in his reports, by Sergeant W. B. Webster, who still remains in charge, and who has given satisfaction by the promptness and accuracy of his reports.

The reports of only four other stations are received here, and the number of bulletins issued consequently small. One is posted at the office, and two press-reports are furnished the daily newspapers. No manifold-maps are issued.

Latitude of station	41° 16'
Longitude of station	96° 00'
Elevation of barometer above sea-level	1000 ft.

The station is furnished with the usual standard instruments, all of which are in good condition. The barometer carried by Sergeant Craig when sent to establish the station was broken in passage, and another one was sent direct from Mr. Green's shop in New York. This is the only barometer in use on station that has not been compared with the standard in the Washington office.

A meteorological committee has been appointed by the board of trade, and efforts have been made to get more reports for the information of the citizens.

Rent of office is \$22 per month.

OSWEGO, NEW YORK, (No. 31.)

The office at this station is located in a front room on the third floor of a building at the corner of Bridge and Front streets, and in the business center of the city. It is one square from the post-office and custom-house, and immediately opposite the Western Union telegraph office. The board of trade rooms are half a square distant, and all the newspaper offices are within three squares.

The wind-vane, anemometer, and rain-gauge are fixed upon a rough platform on the roof of the building; and the exposure is good since the visit of the inspecting officer, under whose direction several changes were made in the location of instruments. The instrument-shelter is built after the standard pattern, and projects from an office window.

The station was established by Sergeant B. F. Hough, who commenced making reports November 1, 1870, and has continued them uninterruptedly since that date. Full reports are received here from all other stations. Seven bulletins are issued daily, and four manifold-maps and three daily papers are furnished with the press-report.

The large weather-map is hung in the observer's office, having been removed there from the board of trade room by order of the inspector, on account of the shortness of time the latter was accessible to the public each day. Private D. C. Murphy has been on duty here as assistant since February 27, 1871.

Latitude of station	43° 28'
Longitude of station	76° 35'
Elevation of barometer above sea-level	261 feet.

The usual standard instruments are used at this station, and are all reported in good condition.

A meteorological committee has been appointed by the board of trade, and much interest is manifested in the reports by the members of the committee and by the citizens generally.

The rent paid for office is at the rate of \$175 per annum.

All the reports have been promptly and properly made, and the general management of the station has been satisfactory.

PHILADELPHIA, PENNSYLVANIA, (No. 17.)

The office is located in the chamber of commerce building, and has been fitted up with great care and at considerable expense for this special purpose. Until September 1, 1871, it was at 505 Chestnut street, where access to the roof of the building for exposure of instruments could not be had. At present the anemometer and range-gauge are well exposed, and the arrangement of the cupola of the building occupied is similar to the form of observatory in use at the Washington office.

The station was established by Sergeant A. W. Eastlake, and reports commenced January 1, 1871. An assistant was sent from the detachment at Fort Whipple, January 16, and remained until April 10, when he was succeeded by Sergeant Sullivan, who being soon afterward transferred to the charge of the Pittsburgh station, was succeeded by Private Bell from the detachment. Sergeant Eastlake was transferred to New York April 19, exchanging with Sergeant Daw, who has been in charge since that date.

Full reports are received here and seven bulletins and fourteen manifold maps issued daily, and nine papers furnished with the press report. A printing-press for the manifold-map has been sent to this station, and when it gets in operation the number of maps issued will be largely increased.

Latitude of station.....	39° 57'
Longitude	75° 12'
Elevation of barometer above sea-level	80 feet.

A full set of standard instruments has been furnished the station, and all of them are reported in good condition. A meteorological committee has been appointed by the board of trade.

Office rent is \$25 per month.

The observer in charge is competent to perform his duties, but has not been as prompt with his mail reports as he should have been, nor has he displayed the amount of energy required to work a station as important as this one; and measures will be taken to supply his place with a man of greater working capacity, and to transfer him to a less important station.

PITTSBURGH, PENNSYLVANIA, (No. 41.)

The office at this station has been a movable one, owing to lack of judgment on the part of the observers who at different times have been in charge, but it is hoped that a permanent location has been secured at last, in the upper story of the First National Bank building, at the corner of Fifth Avenue and Wood street. The first location was at No. 24 Fifth Avenue; then it was moved to Grant street, from there to the St. Clair Hotel, and finally to its present location. It is now on the same floor with the Western Union telegraph-office, within one

square of the post-office, and within the same distance of all the principal newspaper offices.

The wind-vane, anemometer, and rain-gauge are fixed on the roof of the building, and the exposure is as good as can be had in the business part of the city. The instrument-shelter is of the standard pattern, having been remodeled under the direction of the inspecting officer.

The station was established by Sergeant James West, and reports were commenced November 1, 1870, since which time there has been no serious interruption. Sergeant West was sick for several weeks, and the station was worked by Sergeant Eastlake, who was sent there for that purpose, and remained until his transfer to Philadelphia. Sergeant West's conduct was so bad that he was relieved January 31, 1871, by Sergeant H. D. Schmidt, who also failed to perform his duty, and was ordered in May 23, 1871, and succeeded by Sergeant George N. Sullivan, who remained until August 21, when his health became so poor that he was unable to work the station, and was relieved by Sergeant L. M. Crist. An assistant was sent to the station August 23, and its present management is giving satisfaction to the citizens and to this office.

Fifteen reports are received here, four bulletins are issued and posted, and three papers are supplied with the press-report. Manifold-maps are not issued. The large weather-map is hung in the observer's office, and is corrected daily.

Latitude of station.....	40° 32'
Longitude of station.....	80° 02'
Elevation of barometer above sea-level	955 feet.

The station is supplied with a full set of standard instruments, all of which are reported to be in good condition.

The rent paid for office is \$25 per month.

Reports are now made from the station promptly and properly, and the service is gradually becoming of interest to the business and scientific citizens, who were disposed to attribute the misconduct of the two first observers to the system itself, and therefore looked upon it with disfavor.

PORTLAND, MAINE, (No. 12.)

The office at this station is located in the upper story of No. 4 Exchange Place, a building in the center of the business portion of the city. The roof of the building is sloping, and the instruments are fixed upon a rough platform built on the highest part of it. The vane, anemometer, and rain-gauge are well exposed. The instrument-shelter is a small copy of the observatory on the central office, and is also upon the roof, and well adapted to the purpose, but difficult of access.

The station was established by Sergeant William Lewin, and reports commenced January 15, 1871. Sergeant Lewin was relieved for drunkenness on duty April 5, and succeeded by Sergeant R. E. McGrady, who still remains in charge and performs his duties in a satisfactory manner. Private William Ramsey was sent to this station as an assistant June 5, 1871. Full reports are received from all other stations, and seven bulletins are issued daily and three papers supplied with the press-reports.

Latitude of station.....	43° 40'
Longitude of station.....	70° 14'
Elevation of barometer above sea-level	69½ feet.

The station is supplied with a complete set of standard instruments, all of which are reported in good condition.

Rent paid for office is \$18 per month.

PUNTA RASSA, FLORIDA, (No. 59.)

There is only one building at this station, so there was little difficulty experienced in selecting a location for the office. The building referred to is the property of the telegraph company sending the reports, and permission to occupy a portion of it was at once granted by the manager of the office.

The wind-vane, anemometer, and rain-gauge are fixed upon an elevated staging or platform 20 feet high, built for the purpose, and the other instruments are in the office, no regular shelter having as yet been constructed.

The station was established by Sergeant C. E. Ingram, and reports were commenced August 15. No reports are received here and no bulletins are issued.

This being the shore-end of the cable to Key West, all reports for that place necessarily pass through the station and might be taken off if any use could be made of them.

Latitude of station.....	27° 00'
Longitude of station.....	82° 18'
Elevation of barometer above sea-level.....	20 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition.

An allowance of \$18 a month is made for use of office-room.

As all supplies have to come from Key West, considerable difficulty has been experienced in getting furniture and other materials necessary to fit up the station properly.

ROCHESTER, NEW YORK, (No. 32.)

The office at this station was located on the fourth floor of Reynold's Arcade until September 1, when it was removed by order of the inspecting officer to Power's Block, where a better exposure for the instruments is had. The present location is a desirable one, being within easy reach of the post and telegraph offices and in the business center of the city. The office is heated and lighted without expense to the Government.

The wind-vane, anemometer, and rain-gauge are well exposed on the roof of the building. The instrument shelter is built on the roof also, and is a modified copy of the observatory at the central office in Washington.

The station was established by Sergeant F. M. M. Beall, and reports were commenced November 1, 1870. Private M. F. Tighe was sent to station as assistant February 20, 1871. Full reports are received and nine bulletins are issued daily and three papers supplied with the press-report, which is published in full. Two manifold-maps only are issued. The large weather-map is hung up in the court-house and corrected regularly.

Latitude of station.....	43° 8'
Longitude of station.....	77° 51'
Elevation of barometer above sea-level.....	556 feet.

The station is supplied with a full set of standard instruments, and all of them are reported in good condition.

All reports have been made promptly and regularly, and the general management of the station satisfactory.

Rent paid for office is \$18 per month.

SÂN FRANCISCO, CALIFORNIA, (No. 29.)

The office at this station is located in the Merchants' Exchange building, and in the immediate vicinity of the telegraph office and other prominent business places.

The wind-vane and rain-gauge are exposed on the roof of the building. The anemometer is out of repair at present, but a new one will be furnished the station without delay. The cost of skilled labor is so high in this city that the expense of repairing instruments of this nature is greater than the cost of new ones.

The station was established by Sergeant W. P. Faherty, and reports were commenced February 2, 1871. Sergeant S. P. Carusi took charge of the station March 11, 1871, relieving Sergeant Faherty. Four reports only are received here, and bulletins are therefore not posted, but the local observations are furnished to the daily papers and regularly published.

Latitude of station.....	37° 48'
Longitude of station.....	122° 26'
Elevation of barometer above sea-level.....	60 feet.

The station is supplied with a complete set of standard instruments, all of which are in good order except the anemometer, as stated above.

Rent of office is \$28 25 per month, including light and janitor's fee.

SAVANNAH, GEORGIA, (No. 22.)

The office at this station is on the third floor of the building at the corner of Buell and Bay streets. It is within half a square of the telegraph office and within a square of the newspaper offices, exchange and custom-house buildings, board of trade rooms, and the principal hotels.

The wind-vane, anemometer, and rain-gauge are erected on a platform about 8 feet square, which is built upon the highest part of the roof, and the exposure is good. The instrument shelter is of the standard pattern, and projects in the usual manner from a window, through the glass of which the instruments can be read.

The station was established by Sergeant C. W. Held, and reports were commenced January 1, 1871. Private Purdum was sent here as assistant June 12, 1871. No changes have since been made, as the duties have been performed satisfactorily. Full reports are received, and seven bulletins are posted daily and three papers furnished with the press-report. No manifold-maps have been issued, but upon the recommendation of the inspecting officer a supply has been sent to the station, and their issue will be commenced without delay.

Latitude of station.....	32° 5'
Longitude of station.....	81° 8'
Elevation of barometer above sea-level.....	74 feet.

The station is supplied with a complete set of standard instruments, all of which are reported in good condition.

Rent of office is \$15 per month.

The morning papers publish the afternoon reports only.

SHREVEPORT, LOUISIANA, (No. 72.)

The office is in a hotel on Milan street, and near the principal business houses of the town. The instruments are fairly exposed, but no

detailed description has yet been received of their location and exposure, as the station has not been inspected.

The observer who was sent to open the station was a man of experience and supposed to be trustworthy, but he has failed to do his duty here, and will be relieved at once. Reports were commenced September 2, 1871, and have been made irregularly since that date, owing in part to breaks in the telegraph line and partly to neglect of the observer.

Latitude of station	32° 30'
Longitude of station	93° 45'
Elevation of barometer above sea-level	223 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition. The barometer sent out by the observer was broken in transit by a railroad accident, and a second one was sent through the Post-Office Department, and reached the station in safety.

The rent paid for office is \$18 per month.

The observer would have been relieved at an earlier date but for the remoteness of the station and the expense of transportation to and from it, and for the hope that the irregularities were occasioned by illness, as he was injured on the way to the station and detained for several weeks in Vicksburgh before he was sufficiently recovered to proceed.

ST. LOUIS, MISSOURI, (No. 66.)

The office at this station is located on Olive street, and in the immediate vicinity of the post and telegraph offices, and near the principal newspaper offices.

The wind-vane, anemometer, and rain-gauge are well exposed on the roof of the building, and the other instruments in a shelter of the standard pattern.

The station was established by Sergeant Frederick Meyer, and reports commenced November 1, 1870. Sergeant Meyer was selected to accompany the North Polar expedition under Captain Hall, and was succeeded by Sergeant E. H. Singleton, May 23, 1871. An assistant, Private Conrad Schmitt, was sent to station July 12, 1871. Both observers and the assistant have given full satisfaction to the citizens and the office, in the discharge of their duties, all reports being made regularly and promptly, and the personal conduct of the men unexceptionable.

Fifteen reports are received here and bulletined in the most important business places, besides being furnished to all the daily papers, in which they have been printed with great regularity. Manifold-maps are not issued here.

Latitude of station	38° 37'
Longitude of station	90° 16'
Elevation of barometer above sea-level	474½ feet.

The station is supplied with a complete set of standard instruments, and all of them are in good condition.

Office rent is \$25 per month.

Since May 24, 1871, reports to and from Leavenworth have been transferred here, and the work has been well done by the telegraph manager.

ST. PAUL, MINNESOTA, (No. 39.)

The office is located in the upper story of a building on the corner of Third and Wabashaw streets, near the business center of the city, and convenient to the telegraph-office.

The vane, anemometer, and rain-gauge are well exposed on the roof of the building, and the other instruments in a shelter of the standard pattern, projecting from a window in the usual manner.

The station was established by Sergeant I. V. Munger, and reports commenced November 1, 1870. There has been some irregularity in the telegraphic transmission of the reports from this station, owing to the peculiar arrangement of the lines leading to it, but it has been sufficiently regular to make its reports serviceable.

Ten reports are received here, and are bulletined and furnished to the press in the usual manner. All reports have been made properly and promptly, and the general management of the station satisfactory.

Latitude of station.....	44° 53'
Longitude of station.....	93° 05'
Elevation of barometer above sea-level.....	831 feet.

The station is supplied with a full set of standard instruments, all of which are reported to be in good condition. The thermometer is graduated 45° below zero to register the extreme cold.

The amount of rent paid for office is \$8 per month.

The station has not been inspected, therefore the details are not so fully known as desired to make a complete report.

TOLEDO, OHIO, (No. 35.)

The office at this station is on the third floor of the chamber of commerce building on Summit street. The post-office and custom-house are one square distant, and the union and freight depots within three squares.

The vane, anemometer, and rain-gauge are on the roof of building, and well exposed. The shelter for the other instruments is also on the roof, and has louver-boarded sides, and was arranged under the direction of the inspecting officer.

The station was established by Sergeant Henry Fenton, who commenced sending separate reports November 1, 1870. He was transferred to another station, May 3, 1871, and was succeeded by Sergeant A. C. Ford, who still remains in charge, assisted by Private I. Davis. Private Chambers was sent to the station as assistant, February 6, but was relieved on the report of the sergeant, March 18, 1871.

Full reports are received here from all reporting stations. Twelve bulletins are issued daily, and posted in the usual manner. One paper, the Toledo Blade, is furnished with and publishes the full tabular reports, and all the dailies publish the synopsis and probabilities. Manifold-maps are issued and properly distributed. The large weather-map is hung in the room of the board of trade, and is corrected properly.

Latitude of station.....	40° 39'
Longitude of station.....	83° 32'
Elevation of barometer above sea-level.....	644 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition.

The rent paid for office is \$20 per month.

All reports are promptly and neatly made from this station, and the general management satisfactory.

VICKSBURG, MISSISSIPPI, (No. 61.)

The office is located in the business center of the town, and near the post and telegraph-offices.

The vane, anemometer, and rain-gauge are well exposed on the roof of the building, and the shelter for the other instruments is of the standard pattern.

The station was established by Sergeant R. R. Martin, who commenced sending reports September 10, 1871. He is assisted by Private Max Marix, who reported to him for duty September 15, 1871. Thirty reports are received here and bulletined in the usual manner. The daily newspapers do not publish anything but the local observations and the synopsis.

Latitude of station.....	32° 24'
Longitude of station.....	91° 00'
Elevation of barometer above sea-level.....	257 feet.

The station is provided with a full set of standard instruments, and all of them are in good condition.

The rent paid for office is \$25 per month, and considerable difficulty was met with in securing one at any price.

Both the observer and his assistant have been attacked by fever, but have recovered and are again on duty. The reports are made regularly and in good form. The station has not been inspected.

WILMINGTON, NORTH CAROLINA, (No. 20.)

The observer's office is situated at the corner of Market and South Water streets, within one square of the telegraph-office, custom-house, commercial exchange, post-office, and the principal hotels, and the location is as good as can be found in the business part of the city.

The vane, anemometer, and rain-gauge are well exposed on the roof of the building, and the shelter for the other instruments is of the standard pattern, and projects from a window in the usual manner. The building is several feet higher than any of the surrounding ones.

The station was established by Sergeant Robert Seyboth, who commenced sending reports January 1, 1871. He is assisted by Private Henry Bessant, of the signal detachment. Both men have given satisfaction, and all reports have been made regularly and promptly.

Full reports are received here from all stations. Five bulletins are issued, and four of the manifold-maps, and all are posted. The newspapers are furnished with the press-report, and one, the Daily Journal, now publishes the greater part of it.

Latitude of station.....	34° 11'
Longitude of station.....	78° 10'
Elevation of barometer above sea-level.....	31 feet.

The station is supplied with a full set of standard instruments, and all of them are reported to be in good condition.

The office rent is at the rate of \$100 per annum.

WASHINGTON, D. C., (No. 19.)

The observer's office is in the upper story of the building occupied by the Chief Signal Officer, on G street, near the War Department. Upon the flat roof of the building is erected a wooden observatory, designed with great care for the purpose of comparing thermometers and other

instruments in an equal temperature. The walls are of double lattice-work, and are one foot apart. The floor is double, one thickness being fastened to opposite sides of joists one foot in depth, and the boards slightly separated to permit free circulation of air. The roof is of three thicknesses, to guard against the direct effect of the sun's rays. Careful experiments have shown that the temperature does not vary over one half a degree in different parts of the inclosed space, except in winter, when the heat from the chimney near the western side raises the temperature on that side one and a half degrees. The structure is 7 feet square inside, in width and length, and 9 feet in height. On its roof are fixed one wind-vane, two anemometers, and one rain-gauge, all self-registering, and one rain-gauge of the standard pattern.

On the roof of the main building are placed one self-registering rain-gauge and four of the standard pattern, and one large wind-vane, which is made to indicate the direction of the wind by means of a long rod passing through the roof into the office of the observer. It is also made to indicate the direction by means of electricity and an apparatus, to be described in another part of the report.

The work of this office has been laborious, as all instruments were here compared carefully with official standards before issue to stations, all plans proposed for adoption and all changes required at other stations were thoroughly tested before being acted upon decisively, and all instruments offered by manufacturers and others examined and compared. It has also been the base of supplies for all established stations, and the daily shipment of stationery and other necessary supplies requires the constant services of one man.

All reports made by the observers are sent here and compared, and when errors are found the responsible party is called to account. Books of record when filled at a station are sent here for preservation, and the records of all self-registering instruments are filed away for future reference.

Observer D. J. Gibbon has been in charge of the station since its establishment, and has been assisted in the branches named by the following observers, each of whom has had special charge of his own work: examination and comparison of instruments, Sergeant George C. Schaeffer; photographic work, Sergeant C. A. Shaw; printing department, Sergeant Jno. T. Downes; in charge of correspondence and clerical work, Sergeant James B. Newlin.

In addition to their special work each of the observers named has been required to make observations and assist in the issue of maps and bulletins and such other labor connected with the working of the stations as may be necessary. Sergeant Schaeffer has also packed for shipment most of the instruments sent out during the year, and has done this with so much care that few accidents have happened to them, and these have oftener been the result of careless handling than of improper packing. Thermometers have been sent by mail and by express with the result much more favorable to the latter means of transportation. Barometers have been carried by the Post Office Department, however, with greater safety than by the express companies. Of the barometers sent by hand but two have been injured, and both of these by railroad accidents.

The number of bulletins and maps issued daily at this office varies, but will average not far from thirty-five of the former and sixty of the latter. The maps contain all the matter of the bulletins and also the synopses and probabilities prepared by Professor Abbe. The Associated Press agents and the daily papers are furnished with the three synopses

issued daily. The Sunday weekly papers are also supplied. Bulletins are posted in the signal office, at the post-office, and at the main office of the Western Union Telegraph Company, and maps in all of the principal hotels; three large weather-maps are hung in the signal office, on which the weather at the different stations throughout the country, as given at the three daily reports, is indicated by proper symbols. These are changed regularly, and a glance at the maps shows the state and changes of weather for twenty-four hours. The office is kept open continuously, and the men divided into day and night reliefs. Elevation of barometer above sea-level 90½ feet.

In addition to the standard instruments used at all stations, and which are compared here, several varieties of self-registering instruments are being tested and will be described in another part of this report. The manner of printing the map issued daily is quite novel in many of its features and deserves a detailed description.

Previous to May 1 maps of the observations were printed by the "manifold process;" since that time a press has been used which has been found to be far superior to the "manifold." An ordinary "proof-press" is used, with a bed plate, in which square holes are made, coinciding with the stations on the map, in which are placed the symbol type to designate the weather and direction of the wind. The arrows for showing the direction of the wind are diagonal on some of the type, and cross-wise on the rest, making them available for pointing in eight different directions, and fitting so closely in the holes as to prevent their pulling out by the ink-roller; close to each of these holes is cut a slot, in which is set the figure types showing in regular order, first, the height of thermometer, next, the barometer, and, lastly, the velocity of the wind. These are printed in red ink on the black base chart of the United States, the contrast in color rendering them clearly perceptible; at the same time is set up and printed, in the southwest corner of the map, a table showing opposite the name of each station the change of barometer in the last eight hours, change of thermometer in the last twenty-four hours, relative humidity of the atmosphere, and the amount of rain-fall in the last twenty-four hours. Adjoining this table is also printed at the same time the "synopsis for past twenty-four hours," and the "probabilities," making a complete meteorological record for the day.

Provision has been made against the interruption of the reports, in case of the destruction of this office by fire, by the provision of a duplicate office, to which, in the contingency of such disaster, the telegraphic connections may be at once made, and from which the usual issues of the office in maps, the general press-reports &c., could be had without delay.

The charge of stations and of reports has been under the immediate direction of Brevet Captain H. W. Howgate, United States Army, acting signal officer, and assistant, by whom the diverse duties of such a charge have been ably conducted. To the rare fidelity and energy of this officer the successful management of the past year is largely due.

The total number of observer sergeants on duty at stations is 83, and of privates acting as assistants is 40.

In connection with the equipment of these stations the thanks of the Department are due to the Post-Office Department, which has taken upon itself, under the especial order of the Postmaster General, whenever requested, the duty of transporting in care of its mail agents the barometers needed to supply the places of those rendered useless by accident. This service, an unusual one for the Post-Office Department, and requiring great care, has been rendered with invariable success.

The care of the correspondence, papers, and publications of the office necessary for the management of the various duties at Fort Whipple and the stations of observation so widely extended, together with communications with the press, with scientific and other associations, and with individuals scattered throughout the country, is one of magnitude. Table 11, herewith, affords the data of description and of the extent of the labor. The total of papers sent and received by mail has reached an aggregate of 90,514.

Captain Garrick Mallery, first United States Infantry, brevet lieutenant colonel, United States Army, acting signal officer and assistant, has had charge of the general correspondence and records of the office, and has rendered especial and very valuable service.

The duties of the observers at the stations have been already reported to the Secretary of War. The forms appended to this report, and which, in order to systematize labor, are those required to be used and filled by them, sufficiently illustrate the details of the service.

The fact that each observer reports thrice daily by telegraph, at hours fixed to the minute to this office, by the reports he renders, which he is required to present in person at the instrument in the telegraph-office at his station, and on the accuracy of which the neighboring reports are a check, would suffice to secure good conduct, if the character of the men was less high than it is.

There is an additional guard against laxity in the fact that both operator and sergeant are called to an account and at once by telegraph for any missing report, and both are called to correct any manifest error. Neither is willing to be blamed for the carelessness of the other, and each is prompt to fix the fault where it belongs. Each regular general report is in effect a telegraphic roll-call of the stations spread over a continent from the Atlantic to the Pacific and from the northern lakes to the Gulf and the Caribbean Sea. This roll is called in the morning, in the afternoon, and at midnight, at fixed times, and each call must be answered.

In the year of duty now reported, the failures have been of the fewest. There are none which the records of this office fail to give, either the circumstances which excused them, or the censure or punishment of the observers.

The promptitude, regularity, and steadiness with which the stations have been served, have evidenced the wisdom of the act of Congress which placed the service under military control. A rigor less than that of military discipline could not have secured that strict obedience to orders which has been necessary.

The system, as arranged, is capable of indefinite extension. It would be as easy (telegraphic facilities given) to call the roll of stations around the world as of those from New York to San Francisco. In addition to this daily supervision, the condition of the station is assured by regular inspections made personally from time to time by officers instructed for the purpose. The form of inspection (paper 42) exhibits the subjects which come under attention. Two inspecting officers are at this time making a tour of the stations. Since June 15, 1871, twenty-eight stations have been inspected.

In the review of the duties of the past year the Chief Signal Officer finds reason to commend the officers, non-commissioned officers, and men of the signal service for a faithful discharge of duty. Their services have been rendered with a zeal and pride, of which the results are given in the statements above submitted. They are subjected to hardships which it is proper to mention. No branch of the service requires better men, more careful especial instruction, or greater fidelity to duty. There is none involving greater responsibilities. The details for the ser-

vice are, however, wholly temporary. It is just that the position of the observer-sergeants should be fully recognized, and the hope of promotion to be had by faithful discharge of duty be given the deserving. Until this is effected by law, it is recommended that an appointment to a commission be given each year to that sergeant who shall in that year be reported as most distinguished for fidelity and ability.

The need of permanent appointments in the office of the Chief Signal Officer for the now very extensive duties of the Bureau, is pressingly felt. In no branch of duty is more careful selection needed, and in none does long experience render better results. There is no branch of the service of equal importance but for whose duties the officers are permanently commissioned, and can therefore attempt improvement in view of a study and practice which may be life-long.

The care of the Secretary of War has provided for the past year that permanence for these duties to which the success of the office has been largely due. The appointments ought to be lasting.

A year ago the duties of this division could be reported only as a statement of intentions rather than of facts. In the period which has since elapsed a mass of facts have accumulated, and results have been attained, of which there is herewith a rehearsal in outline. It has been a service which has no holidays and can know no rest; the labors of which continue equally throughout every night as well as every day, and to the vigilance of which has been intrusted responsibility extending not only to property but possibly to the life of any citizen of the United States. The appendixes to this report will illustrate the character and the details of the plans adopted; the descriptions of stations, and of the telegraphic arrangements by which the work at each is made available; the aggregate of reports, papers, &c., stated in numbers, indicate the extent of the service. Sufficient data of the times employed for especial portions, of each day's duty, exhibit the effectiveness of the organization provided. Some of the generalizations to be had for scientific purposes from the information collected are given in the circulars annexed. The publications contemplated to be made hereafter from time to time will submit, for the study of scientific men, the facts on which the office has been compelled to act from day to day. It has fallen to this Bureau to take the responsibility of originating, and to hazard erroneous action rather than not to act at all. The results, have been fully as favorable as were anticipated. At the end of the first year the service can be reported with a working organization practically tested, and discharging, with some success, all the duties contemplated for it by Congress. It has been everywhere welcomed with the recognition of the utility of its purposes. The scientists of foreign countries and the scientific institutions throughout the United States have proffered expressions of good will, and have rendered assistance. The chambers of commerce, boards of trade, agricultural societies, commercial associations, and the public press, to all of which so much was due at the outset, have continued to give the aid of their support, and have suggested improvements when these seemed to them practicable. It has been owing to such encouragement and assistance, to the interest the Secretary of War has manifested in this branch of his duties, and that faithful labor of the assistants in this office which has made the care of the Chief Signal Officer supervisory only, that he is enabled to report this progress.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brigadier General, and Chief Signal Officer of the Army.

Hon. W. W. BELKNAP,

Secretary of War, Washington, D. C.

APPENDIX.

RECORD OF SIGNAL CAMP OF INSTRUCTION, FORT WHIPPLE, VIRGINIA.

TABLE I.—Officers instructed during the year ending October, 1871.

Names.	Rank and corps.	Reported for instruction.	Relieved from instruction.	Remarks.
James Franklin.....	Ensign U. S. Navy.	Nov. 10, 1870	Mar. 8, 1871	Completed full course in signaling and telegraphy.
N. J. R. Patch.....	do	Nov. 10, 1870	Feb. 9, 1871	Do. do.
John A. Norris.....	do	Nov. 10, 1870	Feb. 23, 1871	Do. do.
Charles A. Bradbury.....	do	Nov. 10, 1870	Feb. 23, 1871	Do. do.
Nelson T. Houston.....	do	Nov. 12, 1870	Mar. 8, 1871	Do. do.
Edward B. Barry.....	do	Nov. 12, 1870	Feb. 9, 1871	Do. do.
O. M. Mitchel.....	1st Lieutenant, 4th U. S. Artillery.	Feb. 7, 1871	June 1, 1871	Do. do.
Robert Craig.....	do	Feb. 13, 1871	June 1, 1871	Instruction in meteorology only. Acting instructor from May 18 to June 2. Previously instructed in other branches.
C. C. Wolcott.....	2d Lieutenant, 3d U. S. Artillery.	Mar. 3, 1871	July 1, 1871	Completed full course.
Andrew Dunlap.....	Master U. S. Navy.	April 3, 1871	July 10, 1871	Completed full course in signaling and telegraphy.
Willie Swift.....	do	April 3, 1871	June 23, 1871	Do. do.
Alfred Forcé.....	do	April 3, 1871	July 8, 1871	Do. do.
Frederick Singer.....	do	April 3, 1871	June 29, 1871	Do. do.
Edward H. Gheen.....	do	April 3, 1871	June 29, 1871	Do. do.
William H. Reeder.....	do	April 3, 1871	June 28, 1871	Do. do.
Thomas R. Adams.....	1st Lieutenant, 5th U. S. Artillery.	May 27, 1871	Aug. 22, 1871	Completed full course.
H. H. C. Dunwoody.....	1st Lieutenant, 4th U. S. Artillery.	July 10, 1871		On leave of absence.
Charles S. Smith.....	do	July 15, 1871		
H. H. Humphreys.....	1st Lieutenant, 15th U. S. Infantry.	Aug. 18, 1871		Still under instruction.
Henry Jackson.....	1st Lieutenant, 7th U. S. Cavalry.	Aug. 30, 1871	Sept. 25, 1871	Instructed in meteorology only. Previously instructed in other branches.
Charles E. Kilbourne.....	1st Lieutenant, 2d U. S. Artillery.	Sept. 19, 1871		Still under instruction.

TABLE II.—Amount of field practice had by each officer.

Names.	Rank and corps.	No. of days flag practice was had.	No. of nights torch practice was had.	Remarks.
James Franklin.....	Ensign U. S. Navy.....	21	5	
N. J. R. Patch.....	do	16	3	
John A. Norris.....	do	15	3	
Charles A. Bradbury.....	do	15	3	
Nelson T. Houston.....	do	22	5	
Edward B. Barry.....	do	16	3	
O. M. Mitchel.....	1st Lieutenant, 4th U. S. Artillery.	17	5	
C. C. Wolcott.....	2d Lieutenant, 3d U. S. Artillery.	25	3	
Andrew Dunlap.....	Master U. S. Navy.....	27	4	
Willie Swift.....	do	27	5	
Alfred Forcé.....	do	28	4	
Frederick Singer.....	do	25	4	
Edward H. Gheen.....	do	27	4	
William H. Reeder.....	do	27	5	
Thomas R. Adams.....	1st Lieutenant, 5th U. S. Artillery.	15	4	
Charles S. Smith.....	1st Lieutenant, 4th U. S. Artillery.	15	3	
H. H. Humphreys.....	1st Lieutenant, 15th U. S. Infantry.			Still under instruction.
Charles E. Kilbourne.....	1st Lieutenant, 2d U. S. Artillery.			Do. do.

TABLE III.—Number of observer-sergeants instructed.

Name.	Instruction commenced.	Date of examination.	Remarks.
Charles W. Held.....	Oct. 19, 1870	Nov. 29, 1870	In charge of station at Savannah, Ga.
Valentine Hamman.....	Oct. 19, 1870	Nov. 21, 1870	Failed to pass examination; discharged.
Lewis C. Fosnot.....	Oct. 19, 1870	Nov. 29, 1870	Do. do.
Allen L. Bowle.....	Oct. 21, 1870	Nov. 21, 1870	Do. do.
Robert Seyboth.....	Oct. 21, 1870	Nov. 30, 1870	In charge of station at Wilmington, N. C.
William E. Smith.....	Oct. 21, 1870	Nov. 30, 1870	In charge of station at Norfolk.
H. A. Fernald.....	Nov. 23, 1870	Jan. 28, 1871	Failed to pass examination; discharged.
William Lewin.....	Nov. 28, 1870	Jan. 4, 1871	Sent to Portland, Me., in charge of station; discharged for neglect of duty.
Weston Moore.....	Nov. 28, 1870	Jan. 28, 1871	Sent to Nashville in charge of station; reduced to ranks for drunkenness on duty.
John T. Downes.....	Dec. 13, 1870	Jan. 28, 1871	On duty in office of the Chief Signal Officer.
H. D. Schmidt.....	Dec. 20, 1870	Jan. 28, 1871	Sent to Pittsburgh in charge of station; recalled and reduced to ranks for misconduct and neglect of duty.
D. S. Townsend.....	Jan. 6, 1871		Ordered to duty in office of the Chief Signal Officer before completion of course; discharged on his own application.
William McElroy.....	Jan. 7, 1871	Jan. 23, 1871	In charge of station at Corinne, Utah.
James F. Keegan.....	Jan. 10, 1871		Discharged before completion of course, on his own application.
C. F. R. Wappenhans.....	Jan. 10, 1871	Jan. 28, 1871	In charge of station at Indianapolis, Ind.
Thomas L. Watson.....	Jan. 10, 1871	Feb. 9, 1871	In charge of station at Cairo, Ill.
S. P. Carusi.....	Jan. 10, 1871	Feb. 9, 1871	In charge of station at San Francisco, Cal.
P. H. McCabe.....	Jan. 15, 1871		Ordered to duty in office of the Chief Signal Officer before completion of course.
Thomas J. Brown.....	Jan. 20, 1871	Feb. 18, 1871	In charge of station at Louisville, Ky.
F. F. Wood.....	Feb. 6, 1871	Mar. 11, 1871	In charge of station at Grand Haven, Mich.
George N. Sullivan.....	Feb. 6, 1871	Mar. 11, 1871	On duty in office of the Chief Signal Officer.
F. B. Pilling.....	Feb. 7, 1871	Mar. 11, 1871	Do. do.
Rudolph Johnson.....	Feb. 16, 1871	Apr. 3, 1871	Failed to pass examination; discharged.
William Von Hake.....	Feb. 16, 1871	Apr. 3, 1871	In charge of station at Galveston, Texas.
Z. P. Falls.....	Feb. 20, 1871	Apr. 4, 1871	Failed to pass examination; discharged.
A. C. Ford.....	Feb. 22, 1871	Apr. 3, 1871	In charge of station at Toledo, Ohio.
Thomas P. Stout.....	Feb. 25, 1871	Apr. 4, 1871	In charge of station at Marquette, Mich.
R. E. McGrady.....	Feb. 25, 1871	Apr. 4, 1871	In charge of station at Portland, Me.
Theodore F. Townsend.....	Mar. 1, 1871	Apr. 18, 1871	In charge of station at Cape May, N. J.
M. L. Hearne.....	Mar. 4, 1871	Apr. 18, 1871	In charge of station at Mt. Washington, N. H.
H. J. Penrod.....	Mar. 6, 1871	Apr. 18, 1871	In charge of station at Baltimore, Md.
C. J. White.....	Mar. 6, 1871	Apr. 18, 1871	Failed to pass examination; discharged.
George H. Boehmer.....	Mar. 14, 1871	May 12, 1871	In charge of station at Leavenworth City, Kans.
James B. Murray.....	Mar. 15, 1871	May 12, 1871	In charge of station at Lynchburgh, Va.
Hugh Coyle.....	Mar. 20, 1871	May 12, 1871	Failed to pass examination; now on duty as assistant.
L. C. Haven.....	Mar. 27, 1871	May 13, 1871	Failed to pass examination; discharged.
J. N. Martin.....	Apr. 3, 1871	May 13, 1871	In charge of station at Escanaba, Mich.
Robert Courtney.....	Apr. 8, 1871	May 13, 1871	Failed to pass examination; returned to detachment, at Fort Whipple, Va., from which he had been temporarily detached.
R. R. Martin.....	Apr. 10, 1871	May 13, 1871	In charge of station at Vicksburg, Miss.
George H. Richmond.....	Apr. 10, 1871	May 13, 1871	In charge of station at Davenport, Iowa.
James B. Newlin.....	Apr. 15, 1871	May 15, 1871	On duty in office of the Chief Signal Officer.
H. E. Cole.....	Apr. 15, 1871	May 15, 1871	In charge of station at Boston, Mass.
Robert E. Cane.....	May 1, 1871	June 20, 1871	Failed to pass examination; discharged.
J. E. Magruder.....	May 1, 1871	June 9, 1871	In charge of station at Lake City, Fla.
J. H. Garrard.....	May 7, 1871	June 9, 1871	In charge of station at Nashville, Tenn.
Gustave A. Dandeleit.....	May 9, 1871		Reduced to ranks for disobedience of orders.
W. S. Kaufman.....	May 13, 1871	June 9, 1871	On duty at Chicago, Ill.
E. H. Singleton.....		May 23, 1871	Instructed on station; now in charge of station at St. Louis, Mo.
E. O. C. McInerney.....	June 1, 1871	July 11, 1871	Reduced to ranks for misconduct; now on duty as assistant.
George H. Ellery.....	June 6, 1871	July 14, 1871	In charge of station at Burlington, Vt.
John Pearson.....	June 9, 1871	July 14, 1871	On duty in office of the Chief Signal Officer.
L. M. Crist.....	June 13, 1871	July 21, 1871	In charge of station at Pittsburgh, Penn.
S. D. Clark.....	June 15, 1871		Ordered on duty in office of the Chief Signal Officer before completion of course.
C. E. Ingram.....	June 17, 1871	July 21, 1871	In charge of station at Punta Rasa, Fla.
S. W. Rhode.....	June 30, 1871	Aug. 4, 1871	In charge of station at Memphis, Tenn.
William Keadley.....	July 8, 1871	Sept. 22, 1871	Failed to pass examination; discharged.
F. M. Clark.....	July 24, 1871	Aug. 11, 1871	On duty in office of the Chief Signal Officer.
W. H. Cleudonon.....	Aug. 1, 1871	Sept. 22, 1871	Awaiting orders.
George S. Rowley.....	Aug. 5, 1871	Sept. 22, 1871	Do.
E. Garland.....	Aug. 5, 1871	Sept. 22, 1871	Do.
R. L. P. Kelfrieder.....	Aug. 10, 1871		Discharged before completing course.
N. D. Lane.....	Aug. 12, 1871		Still under instruction.
T. Mansfield.....	Aug. 18, 1871		Do.
J. B. Wells.....	Aug. 18, 1871		Do.
George McDonald.....	Aug. 18, 1871		Do.
A. J. Tilley.....	Aug. 19, 1871		Do.

TABLE III.—*Number of observer-sergeants instructed—Continued.*

Name.	Instruction commenced.	Date of examination.	Remarks.
T. Mann	Aug. 24, 1871	.....	Still under instruction.
Charles E. Wheeler	Aug. 25, 1871	.....	Do.
M. J. Shancelfelter	Sept. 8, 1871	.....	Do.
A. B. Knight	Sept. 8, 1871	.....	Do.
D. O'Donoghue	Sept. 13, 1871	.....	Do.
F. P. Bayes	Sept. 14, 1871	.....	Do.
John P. Clum	Sept. 18, 1871	.....	Do.

TABLE IV.—*Instruction and supply of the Army, year ending October 1, 1871.*

	District of New Mexico. ^a	DEPARTMENT—								United States Military Academy. ^b	Total for past year.	Aggregate to date.
	Of Arizona.*	Of Columbia.*	Of California.	Of Dakota.	Of the East.*	Of the Missouri.	Of the Platte.	Of the South.	Of Texas.			
Officers instructed.						21					21	211
Officers partially instructed.				3	74	18	16	57			198	361
Enlisted men instructed.			9		83			31			193	444
Enlisted men partially instructed.			8	45	279	46	178	207			762	1,113
Sets of signal equipments issued to departments and posts.		4		22				7	30			
Telescopes	4	2		14		3		10	4			
Marine glasses				6				2				

* No systematic instruction given.

† All cadets partially instructed.

TABLE V.—*Stations from which weather-reports have been sent during the year ending October 1, 1871.*

Name of station.	Reports commenced.	Name of observer.	Name of assistant.	Remarks.
Augusta, Ga.	Nov. 2, 1870	James R. Allen	F. Mangels	Assistant ordered there June 12, 1871.
Baltimore, Md.	Jan. 1, 1871	H. J. Penrod	A. M. Wagg	Station opened by Sergeant Faherty, who was relieved December 21 by Sergeant Cowan. Sergeant Cowan relieved March 27 by Private Singleton, who remained in charge until relieved by the present observer, May 11, 1871. Assistant ordered May 26, 1871.
Boston, Mass.	Nov. 1, 1870	H. E. Cole	P. J. Huneke	Station occupied by Sergeant D. A. Daboll until May 31, when he was relieved on account of ill health. Assistant ordered January 10, 1871.
Buffalo, N. Y.	Nov. 1, 1870	W. F. Slater	John Clark	Private McInerney ordered as assistant January 23, 1871, and relieved May 18 by Private Clark.
Burlington, Vt.	May 24, 1871	George H. Ellery		Station opened by Sergeant R. R. Martin, who was relieved August 17, 1871.
Cleveland, Ohio	Nov. 1, 1870	Theodore Mosher	W. W. Craig	Private Murphy ordered as assistant February 8, 1871. Relieved February 27, 1871.
Chicago, Ill.	Nov. 1, 1870	James McIntosh.	W. S. Kaufman.	Assistant Williams ordered to station November 7, 1870. Relieved December 31 by Sergeant A. W. Cox, who was relieved in turn by Private Mason February 10, 1871. Private Mason relieved June 15 by Sergeant Kaufman.
Cheyenne, W. T.	Nov. 1, 1870	A. C. Dobbins		

TABLE V.—*Stations from which weather-reports have been sent, &c.*—Continued.

Name of station.	Reports com- menced.	Name of obser- ver.	Name of assist- ant.	Remarks.
Cincinnati, Ohio....	Nov. 1, 1870	F. B. Lloyd.....	E. F. Maynard ..	Station opened by Sergeant F. H. Fletcher. Sergeant Lloyd ordered as assistant January 4, 1871. Took charge of station, in relief of Sergeant Fletcher, June 22, 1871. Sergeant Garrard ordered as assistant June 22. Relieved August 4 by Private Maynard.
Charleston, S. C.	Jan. 5, 1871	J. E. Evans	J. O'Dowd	Assistant ordered June 12, 1871.
Corinne, Utah.	Feb. 2, 1871	William McElroy ..	.....	.....
Cape May City, N. J.	May 24, 1871	T. F. Townsend ..	.....	.....
Quincy, Ill.	June 1, 1871	T. L. Watson	J. M. Watson	Station opened by Sergeant H. Fenton, who was relieved September 18, 1871. Assistant ordered August 22, 1871.
Duluth, Minn.	Nov. 1, 1870	A. B. Williams .....	.....	Station opened by Sergeant A. W. Cox, who was relieved December 31, 1870.
Detroit, Mich.	Nov. 1, 1870	Allen Buell	E. McGovern	Private J. A. Graham ordered to station as assistant February 6, 1871, and relieved August 14, 1871.
Davenport, Iowa....	May 24, 1871	G. H. Richmond ..	Edward Lloyd	Assistant ordered to station July 24, 1871.
Escanaba, Mich.	May 24, 1871	J. N. Martin .....	.....	.....
Galveston, Texas....	April 19, 1871	William Von Hake ..	E. O'C. McInerney.	Assistant ordered to station August 18, 1871.
Grand Haven, Mich.	May 24, 1871	F. F. Wood .....	.....	.....
Indianapolis, Ind.	Feb. 10, 1871	C. F. R. Wappenhans.	M. A. Rath	Assistant ordered to station August 22, 1871.
Jacksonville, Fla.	Sept. 11, 1871	D. A. Daboll .....	.....	.....
Key West, Fla.	Nov. 1, 1870	John R. Allen .....	.....	.....
Knoxville, Tenn.	Jan. 20, 1871	J. K. Payne .....	.....	.....
Keokuk, Iowa.	July 15, 1871	A. C. Barclay	W. W. Warren	Assistant ordered August 4, 1871.
Lake City, Fla.	Nov. 1, 1870	J. E. Magruder ..	S. W. Beall	Station opened by Sergeant A. C. Barclay, who was transferred to Keokuk June 23. Assistant ordered September 25, 1871.
Leavenworth, Kans.	May 24, 1871	George H. Boelmer.	.....	.....
Louisville, Ky.	Sept. 11, 1871	T. J. Brown	— Lawler	Assistant ordered to station —, 1871.
Lynchburg, Va.	May 24, 1871	James B. Murray ..	.....	.....
Milwaukee, Wis.	Nov. 1, 1870	Alfred Brimer	R. Williams	Private Gilligan ordered to station January 17, 1871; relieved September 9 by private Gorselin, who was relieved September 14, 1871, by Private Williams.
Montgomery, Ala.	Nov. 4, 1870	J. E. Evans	None	Abandoned, and observer transferred to Charleston, S. C., December 13, 1870.
Mobile, Ala.	Nov. 7, 1870	A. R. Thornett	William Line	Assistant ordered May 18, 1871.
Mount Washington, N. H.	Dec. 15, 1870	M. L. Hearne	William Stevens.	Station opened by Sergeant Theodore Smith, who was relieved on account of ill health May 22, 1871. Assistant ordered to station September 7, 1871.
Memphis, Tenn.	Feb. 28, 1871	S. W. Rhode	Hugh Coyle	Station opened by Sergeant Thomas J. Brown, who was transferred to Louisville August 28, 1871. Assistant ordered to station June 17, 1871.
Marquette, Mich.	May 11, 1871	T. P. Stout	None .....	.....
Nashville, Tenn.	Nov. 1, 1870	J. H. Garrard	W. Henderson	Station opened by Sergeant G. H. Witmer, who was relieved January 31 by Sergeant W. Moore, who was relieved by Sergeant T. L. Watson February 10, 1871. Sergeant Watson relieved August 4, 1871. Assistant ordered to station July 6, 1871.
New Orleans, La.	Nov. 1, 1870	D. S. Pullen	J. McCoy	Assistant ordered to station May 18, 1871.

TABLE V.—*Stations from which weather-reports have been sent, &c.—Continued.*

Name of station.	Reports commenced.	Name of observer.	Name of assistant.	Remarks.
New York City	Nov. 1, 1870	C. R. Estabrook	A. W. Eastlake	Sergeant C. R. Daw ordered as assistant to this station November 15. Transferred to charge of Philadelphia station April 19, 1871, and succeeded by Sergeant Eastlake.
Norfolk, Va.	Jan. 1, 1871	W. E. Smith....	M. Foley.....	Assistant ordered to station June 5, 1871.
New London, Conn.	Jan. 15, 1871	C. E. Brinsmade.	John Healey....	Assistant ordered to station June 15, 1871.
North Polar Expedition.		F. Meyer	None	On steamer Polaris, with Captain Hall.
Omaha, Neb	Nov. 1, 1870	W. B. Webster..	None	Station opened by Sergeant W. W. Craig, who was relieved November 9, 1871.
Oswego, N. Y	Nov. 1, 1870	B. F. Hough	D. C. Murphy ..	Assistant ordered to station February 27, 1871.
Pittsburgh, Pa	Nov. 1, 1870	L. M. Crist.....	H. Barton	Station opened by Sergeant James West, who was relieved January 31 by Sergeant H. D. Schmidt. Sergeant Schmidt was relieved May 23 by Sergeant George N. Sullivan, who was transferred to Washington station August 21, 1871.
Portland, Me	Jan. 15, 1871	R. E. McGrady..	William Ramsay	Station opened by Sergeant William Lewin, who was relieved April 5, 1871. Assistant ordered to station June 5, 1871.
Philadelphia, Pa	Jan. 1, 1871	Charles R. Daw.	R. J. Bell	Station opened by Sergeant A. W. Eastlake, who was transferred to New York station April 19, 1871. Sergeant George N. Sullivan was sent to station as assistant April 10, and was transferred to Pittsburgh May 23. Private McCoy sent as assistant January 16, 1871, and relieved April 15, 1871.
Punta Rasa, Fla	Aug. 15, 1871	C. E. Ingram	None	
Rochester, N. Y	Nov. 1, 1870	F. M. M. Beall ..	M. F. Tighe	Assistant ordered to station February 25, 1871.
St. Louis, Mo	Nov. 1, 1870	E. H. Singleton.	Conrad Schmitt.	Station opened by Sergeant F. Meyer, who was transferred to North Polar Expedition May 23, 1871. Assistant ordered to station July 12, 1871.
St. Paul, Minn	Nov. 1, 1870	I. V. Munger	None	
Savannah, Ga	Jan. 1, 1871	C. W. Held	J. K. P. Purdum	Assistant ordered to station June 12, 1871.
San Francisco, Cal.	Feb. 2, 1871	S. P. Carusi	None	Station opened by Sergeant W. P. Faherty, who was relieved March 11, 1871.
Shreveport, La	Sept. 2, 1871	F. H. Fletcher ..	None	
Toledo, Ohio	Nov. 1, 1870	A. C. Ford	John Davis	Station opened by Sergeant Henry Fenton, who was relieved May 3, 1871. Private Chambers ordered to station as assistant February 6, and relieved March 18, 1871.
Vicksburgh, Miss..	Sept. 10, 1871	R. R. Martin....	Max Marix	Assistant ordered to station September 11, 1871.
Washington, D. C.	Nov. 1, 1870	D. J. Gibbon....	Geo. C. Schaeffer, C. A. Shaw	
Wilmington, N. C.	Jan. 1, 1871	Robert Seyboth.	Henry Bessant..	Assistant ordered to station June 5, 1871.

TABLE VI.—*Showing telegraphic circuits used for weather-reports.*

No.	Circuit.	Length in miles.	Names of stations on each circuit.
1	Washington and New York*.....	220	
2	Washington and New Orleans*.....	1,250	
3	Washington and Chicago*.....	842	
4	New York and Portland.....	337	New York, New London, Boston, Portland.
5	Mount Washington and Boston.....	163	Mount Washington, Boston.
6	Burlington and Boston.....	237	Burlington, Boston.
7	Washington and Knoxville.....	562	Washington, Lynchburgh, Knoxville.
8	New York and Lake City.....	1,138	New York, Philadelphia, Cape May, Baltimore, Washington, Norfolk, Wilmington, Charleston, Augusta, Savannah, Lake City.
9	Lake City and Key West.....	350	Lake City, Punta Rassa, Key West.
10	Lake City and Jacksonville.....	100	Lake City, Jacksonville.
11	Augusta and New Orleans.....	775	Augusta, Mobile, New Orleans.
12	New York and Milwaukee.....	1,019	New York, Oswego, Rochester, Buffalo, Cleveland, Cincinnati, Toledo, Detroit, Chicago, Milwaukee.
13	Detroit and Grand Haven.....	189	Detroit, Grand Haven.
14	Milwaukee and Marquette.....	317	Milwaukee, Escanaba, Marquette.
15	Milwaukee and Du Luth.....	541	Milwaukee, St. Paul, Du Luth.
16	Chicago and Pittsburgh.....	537	Chicago, Pittsburgh.
17	Chicago and New Orleans.....	1,050	Chicago, Indianapolis, Louisville, Nashville, Memphis, Vicksburgh, New Orleans.
18	Chicago and Cairo.....	425	Chicago, St. Louis, Cairo.
19	St. Louis and Leavenworth.....	313	St. Louis, Leavenworth.
20	New Orleans and Galveston.....	387	New Orleans, Galveston.
21	Chicago and San Francisco.....	2,337	Chicago, Davenport, Omaha, Cheyenne, Corinne, San Francisco.
22	Chicago and Keokuk.....	245	Chicago, Keokuk.
23	New Orleans and Shreveport.....	450	New Orleans, Shreveport.
24	San Francisco and Portland.....	688	San Francisco, Portland.
25	San Francisco and San Diego.....	562	San Francisco, San Diego.

* Special through circuit.

TABLE VII.—Location of observation offices, with elevation, and number of reports received at each.

Station.	Street and number.	Elevation of barometer above sea level.	Number of stations from which reports are received times each day.	Number of bulletins issued daily.	Number of maps issued.	Number of papers supplied with reports.
		<i>Feet.</i>				
Augusta	17 McIntosh street	173	55	12	0	2
Baltimore	Corner South and Water streets	45	55	11	5	5
Boston	103 Court street	82	54	9	5	7
Buffalo	22 Weed's Block	624.6	53	6	2	4
Burlington	City Hotel	401	5	0	0	1
Cairo	65 Ohio levee	400	15	3	3	2
a Cape May	8 North street	14	0	12	0	1
Charleston	Corner Day and Broad streets	64	55	2	0	2
Cheyenne	Sixteenth, between Fergusson and Hill streets	6,057	4	2	0	0
b Chicago	10 West Randolph street	645	53	17	8	4
Cincinnati	Pike's Opera House	636	53	13	11	5
Cleveland	Atwater Building	671	53	3	4	3
Corinne	Montana, between Fourth and Fifth streets	4,308	4	1	0	1
c Davenport	First National Bank building, corner Main and Second streets	645	23	2	0	0
Detroit	Corner Griswold and Congress streets	656	53	40	22	4
Du Luth	Edmond's Block, Superior street	660	10	9	0	3
Escanaba	Tilden street	603	11	9	0	1
Galveston	67 Strand	50	18	6	0	2
Grand Haven	Akley's Building	599	9	7	0	3
Indianapolis	Corner Meridian and Washington streets	748	30	2	0	5
d Jacksonville	Freedman's Bank, corner Pine and Forsyth streets	23	9	0	0	2
Keokuk	Corner of Main and Second streets	580	26	2	0	2
Key West	Office of C. Tift & Co.	20	9	4	0	1
Knoxville	University	1,007	1	3	0	0
Lake City	Marion and Franklin streets	190	10	0	0	0
Leavenworth	71 Delaware street	929	14	9	0	3
e Louisville	Custom-house	493.6	30	0	0	4
Lynchburg	Corner of Eighth and Court streets	650	21	2	0	0
Marquette	Corner of Spring and Front streets	668.45	11	23	0	1
Memphis	257 Second street	285.11	30	7	0	3
Mount Washington	Railroad depot	6,292	0	0	0	0
Milwaukee	Chamber of Commerce building	641	53	9	2	4
Mobile	48 Saint Michael street	50	11	4	0	2
f Montreal	Observatory	182				
Nashville	30 College street	532	30	5	0	2
g New London	1 Water street	21	54	6	0	2
h New Orleans	222 Custom-house street	47	30	5	0	3
New York	120 Broadway, Equitable Insurance building	128	55	22	15	12
Norfolk	Corner Main and Gray streets	54	55	2	7	3
Omaha	195 Farnam street	1,000	4	3	0	2
Oswego	Grant Block	261	53	7	4	3
Philadelphia	Chamber of Commerce building	80	55	8	13	9
Pittsburgh	First National Bank building	955	15	4	0	3
Portland	4 Exchange Place	69.6	54	7	0	3
i Punta Rasa	Telegraph office	20	9	0	0	0
Rochester	Powers Block	556	53	9	2	3
j San Francisco	Merchants' Exchange building	60	4	0	0	2
k Savannah	Bull and Bay streets	74	55	2	0	3
l Shreveport	84 Milan street	223	0	0	0	0
Saint Louis	210 Olive street	474.6	15	5	0	3
Saint Paul	Third and Wabashaw streets	831	10	2	0	3
Toledo	Finley's Block	644	53	12	2	1
m Vicksburg	139 Washington street	257	30	0	0	0
Washington	Chief Signal Office	90.6	55	35	60	9
Wilmington	South Water and Market streets	31	55	5	5	2

a When reports are received, which is during the summer.

b Before the fire. No report since.

c Number of papers unknown.

d No report made of bulletins.

e Number of bulletins not reported.

f Voluntary reports made. No figures given.

g One of the papers published in Norwich.

h Maps not reported.

i No paper at station.

j No report of bulletins made.

k Maps will be issued soon.

l No reports received at this station.

m No report made.

TABLE VIII.—Statement showing number of words of weather-reports transmitted over signal circuits, monthly, from November 1, 1870, to March 4, 1871.

Circuit.	November 1 to 30.	December 1 to 31.	January 1 to 31.	February 1 to 28.	March 1 to 4.	Total for each circuit.
New York and Boston . . .	13, 900	13, 640	8, 008	19, 712		34, 848
New York and Portland . .	9		11, 748	2, 816		34, 276
New York and Washington .	26, 136	26, 664	26, 400	29, 128	4, 400	112, 728
New York and Lake City . .	6, 600	6, 820				13, 420
New York and Augusta . . .			17, 732	16, 016	2, 288	36, 036
Augusta and Lake City . . .			10, 912	9, 856	1, 408	22, 176
Lake City and Key West . .	1, 320	1, 364	8, 184	7, 392	1, 056	19, 316
Augusta and New Orleans . .	5, 880	4, 840	9, 548	8, 674	1, 232	30, 174
New York and Knoxville . .			528	1, 232	1, 176	1, 936
New York and Chicago . . .	32, 736	33, 464				66, 200
New York and Milwaukee . .			44, 132	45, 144	6, 688	95, 964
Chicago and Pittsburgh . . .	1, 320	1, 364	1, 364	1, 232	176	5, 456
Chicago and New Orleans . .	7, 920	8, 184	9, 548	9, 504	1, 584	36, 740
Chicago and St. Louis . . .	1, 320	1, 364	1, 364	1, 232	176	5, 456
Chicago and Du Luth	5, 280	5, 456				10, 736
Milwaukee and Du Luth . . .			4, 092	3, 696	528	8, 316
Chicago and Omaha	2, 640	2, 728	2, 728	88		8, 184
Omaha and Cheyenne	1, 340	1, 364	1, 364	44		4, 112
Chicago and San Francisco . .				4, 752	704	5, 456
Total for each month . . .	105, 692	107, 272	157, 632	157, 702	23, 232	551, 550

TABLE IX.—Statement showing number of words of weather-reports transmitted over signal circuits, monthly, from May 24 to September 30, 1871.

Circuit.	May.	June.	July.	August.	September.	Total.
New York and Portland . . .	16, 544	63, 360	66, 968	67, 616	70, 048	284, 536
Boston and Mount Washington .	352	1, 320	1, 364	1, 364	1, 320	5, 720
Boston and Burlington . . .	2, 112	7, 920	8, 184	8, 184	7, 920	34, 320
Knoxville and Washington . .	704	2, 640	2, 728	2, 728	2, 640	11, 440
New York and Lake City . . .	16, 544	63, 360	66, 968	68, 948	69, 368	285, 188
Augusta and New Orleans . . .	3, 168	11, 880	12, 276	13, 024	15, 300	65, 648
Lake City and Key West . . .	352	1, 320	1, 268	1, 496	4, 752	9, 188
New York and Milwaukee . . .	15, 840	60, 720	64, 240	65, 052	68, 728	274, 580
Detroit and Grand Haven . . .	3, 520	13, 200	13, 640	13, 640	13, 900	57, 900
Chicago and Pittsburgh	4, 224	17, 160	17, 732	17, 732	20, 284	77, 132
Chicago and New Orleans . . .	8, 800	34, 320	35, 464	35, 044	38, 764	152, 392
Chicago and Cairo	4, 576	17, 160	17, 732	17, 732	20, 284	77, 484
St. Louis and Leavenworth . .	352	1, 320	17, 732	17, 732	19, 008	56, 144
Galveston and New Orleans . .	5, 632	21, 120	21, 824	21, 404	24, 640	94, 620
Chicago and San Francisco . . .	1, 760	11, 528	16, 368	21, 120	30, 844	81, 620
Chicago and Keokuk			17, 952	32, 152	34, 804	84, 908
Milwaukee and Marquette . . .	4, 224	15, 840	16, 368	16, 368	15, 840	68, 640
Milwaukee and Du Luth	3, 872	14, 520	15, 004	15, 004	14, 520	47, 916
New Orleans and Shreveport . .					1, 276	1, 276
Total						1, 759, 952

TABLE X.—Number of words of weather-reports received at the office of the Chief Signal Officer, in Washington, D. C., from November 1, 1870, to September 30, 1871.

Name of month.	Year.	Number of words.
November	1870	31, 416
December	1870	32, 164
January	1871	39, 340
February	1871	42, 774
March	1871	47, 366
April	1871	50, 268
May	1871	56, 024
June	1871	60, 697
July	1871	64, 798
August	1871	67, 798
September	1871	69, 284
Total		561, 929

TABLE XI.—Table exhibiting the communications sent from and received at the office of the Chief Signal Officer, (exclusive of all telegrams,) from October 20, 1870, to October 31, 1871.

SENT.

Division of telegrams and reports for the benefit of commerce.

To heads of departments and bureaus	105
To observer-sergeants in reference to their duties	4,480
In reply to applications for stations, and others similar	115
To telegraphic companies in reference to transmission of weather-report	624
To boards of trade, chambers of commerce, and agricultural societies	983
To foreign correspondents relating to this division	18
Answers to applications for appointments as observer-sergeants	516
To surgeon, asking for physical examination of observer-sergeants, &c.	91
To officer in charge of Fort Whipple, Virginia, prior to order announcing observer-sergeants	29
General and special orders with reference to this division	1,679
Suggestions as to practical use of meteorological reports and weather-maps sent specially	929
Letters with circulars regarding cautionary signals sent specially	948
Miscellaneous	652
Total	11,229

Signal division.

To heads of departments and bureaus	21
Relating to enlisted men	202
Concerning instruction in signaling	134
Miscellaneous	101
Total	518

Property division.

To heads of departments and bureaus	535
To manufacturers and others in reference to equipments, instruments, &c.	423
To observer-sergeants and men in the field, in reference to property and money accounts	7,550
Concerning quarterly returns of officers	310
Miscellaneous	662
Total	9,480
Papers comprising subjects in more than one of the divisions named	1,779
Aggregate	23,006

RECEIVED.

Division of telegrams and reports for the benefit of commerce.

From heads of departments and bureaus	83
Applications for stations, &c.	114
From telegraph companies, in reference to transmission of weather-map	307
From observer-sergeants, in reference to their duties, &c.	2,406
From boards of trade, chambers of commerce, and agricultural societies	231
From foreign correspondents relative to this division	29
Special applications for "Suggestions for Practical use of Weather-maps, &c."	336
Reports for instruction for observer-sergeants	392
Applications for appointment as observer-sergeants	516
Reports of preliminary examinations of observer-sergeants, &c.	163
Answers from surgeon, with report of physical examinations of observer-sergeants, &c.	91
Reports of final examinations of observer-sergeants	102
Mailed reports of observer-sergeants on station	50,940
Miscellaneous	578
Total	56,288

Signal division.

From heads of departments and bureaus.....	98
Relative to instruction in signaling	718
Relative to enlisted men	192
Miscellaneous	867
Total.....	1,875

Property division.

From heads of departments and bureaus	95
Relative to free entry of books, instruments, &c	26
From manufacturers and others, relating to instruments, &c	415
From officers, concerning property, quarterly returns, &c	533
From observer-sergeants and men on stations, relating to property returns and money-accounts	5,070
From observer-sergeants and men on stations, regarding commutation of rations, extra-duty pay, and commutation of fuel and quarters audited and paid from this office	1,422
Regarding property transferred to stations	1,223
Miscellaneous	561
Total	9,345
Aggregate	67,508
Aggregate sent	23,006
Aggregate received	67,508
Total	90,514

TABLE XII.—*Enlistments for signal service, United States Army, from October 20, 1870, to October 31, 1871.*

Number enlisted after passing examination for observer-sergeants, and promoted at once to that position	71
Enlisted as privates signal service detachment	62
	133
Selected recruits forwarded from general recruiting depot, at Fort Columbus, New York Harbor, by order of the Secretary of War	38
Total	171

PAPER 424.

[Circular.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE,
Washington, D. C., July 1, 1871.

The following circular is published for the information of those desiring to enlist for appointment as non-commissioned officers in the Army, for the duties of the "observation and report of storms by telegraph and signal for the benefit of commerce," under the joint resolution of Congress, approved February 9, 1870, and the authorization of the Secretary of War, and for such other duties as may be required in connection therewith.

Every candidate will be subjected to an examination, prior to enlistment, before a board appointed by the Chief Signal Officer, which meets at this office every Thursday at noon, and before which he must appear at his own expense. Testimonials as to good character and capacity, signed by persons known at this office, must be presented, together with an application in the handwriting of the candidate, (addressed to the Chief Signal Officer of the Army,) stating his age, past and present avocation and residence. The examination will be chiefly directed to accurate spelling, legible handwriting, proficiency in arithmetic, with special attention to decimal fractions, and the geography of the United States.

Persons enlisting for this service will be disciplined in the duties of non-commissioned officers, but will not be transferred to other duties than those pertaining to the signal service.

The United States is entitled to the whole time of the person enlisted; but the duties required are of such a nature that, with care and diligence, some time between the hours of reports, when no active duty is pressing, will be at the disposal of the observer, which may be devoted to reading or study. Most of those already enlisted have had such purposes in view. No employment of this nature can, however, be permitted to interfere in any way with that prompt and constant attention to duty which will be insisted upon.

Candidates, after successfully passing the educational examination above referred to, and also a physical examination by the surgeon, will be enlisted in the general service of the United States, and will then receive the appointment and pay of sergeant from the date of enlistment. If, however, after having been for a reasonable time under the course of instruction provided to fit them for the discharge of the duties of observer, they fail to pass another examination, directed with reference to that instruction, they will be immediately discharged, as unfitted for the service. The length of the course of instruction varies according to the ability and industry of the several sergeants, averaging about five weeks.

All the duties will be performed strictly under the discipline of military law, all persons in the military service being subject to trial and punishment for improper conduct or neglect of duty, under the Rules and Articles of War. Those whose services are no longer required, while their conduct has been good, or who may be discharged at their own request for satisfactory reasons, will receive honorable discharges. The term of service is five years, unless sooner discharged. The Secretary of War has power to grant discharges, which this office is authorized to promise when applied for on proper grounds, and at times when no special injury to the service would result therefrom.

The penalties for neglect of duty, bad conduct, &c., are dishonorable discharge, or such other punishment as a court-martial may direct, or as may be provided for by the customs of the service. The pay and allowances are as follows: A sergeant on this duty serving with troops (as stationed at a military post where other troops are serving, or whose quarters, fuel, &c., are furnished in kind) receive as follows:

Pay per month	\$27 50
Pay per year	331 75

with rations, and the money value of clothing not drawn in kind.

A sergeant on this duty stationed in a city, or at a point where there are no other troops serving, receives, approximately, as follows:

	Per month of 30 days.	Per year.
Pay	\$17 00	\$204 00
Subsistence	22 50	273 75
Clothing, (varying each year,) average about	2 96	35 45
Quarters	10 00	120 00
Fuel	8 00	96 00
Extra-duty pay, 35 cents per day	10 50	127 75
	<hr/> 70 96	<hr/> 856 95

It is not designed that any observer-sergeant, after passing the second examination, shall, for any length of time, be stationed with troops; and none are now so stationed.

The duties will be chiefly those pertaining to the observations, record, and proper publication and report, at such times as may be required, of the state of the barometer, thermometer, hygrometer, and rain-gauge, or other instruments, (instructions in the use of which instruments will be given by this office,) and the report by telegraph or signal, at such times as indicated, and to such places as may be designated by the Chief Signal Officer, of the observations as made, or such other information as may be required; the telegraphic reports to be forwarded by the regular telegraphic operators, or in such manner as may be directed. The utmost precision will be required in observations and reports. The specification of these particular duties is not to exclude others connected therewith which may be necessary.

The object of this plan is to insure the correctness and regularity of reports, by having them made under military control. It being desired to make this body of men especially select, rigid examinations will be insisted upon.

Married men are not enlisted, and only persons between the ages of twenty-one and forty years.

NOTE.—When this circular is sent in answer to any inquiry, it may be understood that vacancies still exist in the number of observer-sergeants authorized, and that candidates may continue to apply as above directed.

P. S.—SEPTEMBER 16, 1871.—The above circular is furnished in answer to inquiries, as exhibiting the pay and duties of the position described. The mode of obtaining it is from this date changed as follows:

Application for examination by the board above-mentioned will not be entertained except when made by men enlisted in the signal service detachment, United States Army, who shall have satisfactorily performed, for six months, the duty of assistant to an observer on station, or similar duty at this office. The compensation when on such duty is about fourteen dollars per month less than that of an observer-sergeant, and the character of the duty is substantially the same as that of the observer, for which position it is a preparation.

Persons desiring to enlist in the signal service detachment with the view of subsequent promotion to the grade of observer-sergeant must possess the general qualifications and present the same testimonials as are required for those sergeants, according to the terms of the foregoing circular. They must report themselves in person to this office, at their own expense, and satisfy the officer charged with the duty of enlistment that they are fitted for the service, after which they will be examined by the surgeon, and, if physically competent, will be enlisted, and ordered, in the first instance, to Fort Whipple, Virginia, near this city, where the signal service detachment and school of instruction is stationed. Before being placed on duty as assistant (the length of which delay can only be determined by the requirements of the service and the conduct of the individual) his pay, quarters, allowances, and duties will be those of a private soldier. No promise will be given by this office which can alter or affect the usual terms of enlistment, but it is expected and desired to make service in the detachment probationary for, and preparatory to, the grade of observer-sergeant, and to place competent men who enlist with a view to that position on duty as assistants, where instruction can be obtained and opportunities for study afforded.

By order of the Chief Signal Officer of the Army :

GARRICK MALLERY,

Capt. and Bvt. Lieut. Col., U. S. A., Acting Signal Officer and Assistant.



PAPER 1.—FORM 3.

DAILY BULLETIN.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.

Division of telegrams and reports for the benefit of commerce.

Meteorological record, November 1, 1870, 7.35 a. m.

Observations at all the stations taken at the same moment of time.

Place of observation.	Height of barometer.	Change since last report.	Thermometer.	Change in last 24 hours.	Relative humidity. (Per cent.)	Direction of wind.	Velocity of wind. (Miles per hour.)	Pressure of wind. (Lbs. per square foot.)	Force of wind reduced to Beaufort scale. (Approximately.)	Amount of cloud.	Rain-fall since last report. (Inches and hundredths.)	State of weather.
Albany, N. Y.												
Augusta, Ga.												
Baltimore, Md.												
Boston, Mass.	29.65	44				W.	3	.04	Gentle			Fair.
Buffalo, N. Y.	29.38	40				W.	7	.24	Light			Clear.
Charleston, S. C.												
Cheyenne, W. T.	27.12	45				W.	13	.83	Brisk			Clear.
Chicago, Ill.	31.03	40				S. W.	14	.75	Brisk			Clear.
Cincinnati, Ohio	29.52	41				S. E.	5	.12	Light	1-4		Clear.
Cleveland, Ohio.	30.09	35				S. E.	12	.83	Brisk			Clear.
Corinne, Utah												
Detroit, Mich.	29.84	37				S.	5	.12	Light			Clear.
Du Luth, Minn.	28.99	37				S. W.	4	.07	Light			
Fortress Monroe, Va.												
Fort Benton, M. T.												
Indianapolis, Ind.												
Jackson, Miss.												
Key West, Fla.	29.98	75				E.	4	.07	Gentle	4-4		Cloudy
Knoxville, Tenn.												
Lake City, Fla.	30.05	62				0	0	0	Calm	1-4		Clear.
Louisville, Ky.												
Memphis, Tenn.												
Milwaukee, Wis.	30.07	42				W.	12	.83	Brisk			Clear.
Mobile, Ala.												
Montgomery, Ala.												
Nashville, Tenn.	30.08	51				N.	2	.02	Gentle	1-2		Fair.
New Haven, Conn.												
New Orleans, La.	30.08	64				N. E.	3	.04	Gentle	1-4		Fair.
New York, N. Y.	30.12	45				0	0	0	Calm			Clear.
Omaha, Nebr.	29.32	36				S.	4	.07	Gentle			Clear.
Oswego, N. Y.	29.94	44				W.	20	1.96	Very brisk			Fair.
Philadelphia, Pa.												
Pittsburgh, Pa.	29.32	38				S.	3	.04	Gentle	1-4		Fair.
Portland, Me.												
Portland, Oregon												
Rochester, N. Y.	30.03	40				W.	7	.24	Light	3-4		Fair.
San Diego, Cal.												
San Francisco, Cal.												
Santa Fé, N. M.												
Savannah, Ga.												
St. Louis, Mo.	29.91	45				S. E.	7	.24	Light			Clear.
St. Paul, Minn.	29.50	38				E.	1	.01	Very light			Clear.
Toledo, Ohio.	30.00	38				S.	2	.02	Gentle			Clear.
Washington, D. C.	30.03	45				W.	1	.01	Light	1-4		Fair.
Wilmington, N. C.												

[Published by order of the Secretary of War.]

NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, Northwestern, and International Ocean Telegraph Companies.

PAPER 2.

ATMOSPHERIC ELECTRICITY.

That electricity has much to do with the condition of the weather, and with its numerous, constantly-recurring changes, is known to every one. There is just now a disposition among meteorologists to give this mysterious force much of the credit heretofore awarded to heat, for the general circulation of the atmosphere, the permanent, ever-flowing winds. It therefore becomes important to have a series of observations, made several times a day, and continued through many years, showing the quantity and kind of electricity in the atmosphere. It is fair to suppose that such observations might be made of great utility in our endeavor to anticipate the approach of storms upon our lake-shores and sea-coasts, for the benefit of commerce.

So far as I know, Dr. Wislizenus, of St. Louis, Missouri, is the only person in this country who has applied himself to the elucidation of this important problem of atmospheric electricity. He has devoted to this subject an amount of patient and persevering labor which entitles him to the thanks of all meteorologists. To make six regular daily observations, each requiring careful manipulation, and to continue them, from month to month, for ten consecutive years, with no other hope of reward than the consciousness of adding to the sum of human knowledge, is a task few would voluntarily undertake.

The electrometer used by him is one contrived expressly for the purpose by Professor F. Dellman, of Germany, being a torsion-balance, and is fully described by Dr. Wislizenus as follows:

"A very fine glass thread, about 18 inches long, running vertically through a glass tube, has on its lower end, fastened by shellac, a very thin and light beam or needle of brass, in a horizontal position. This beam, when moved by any force, will be driven around in a circle over a metallic disc, with a graduated scale divided into four times ninety degrees. Directly below the movable beam, but not connected with it, is another similar thin piece of brass, which is fixed, perfectly isolated from the metallic disc, and ends below in a metallic wire, also isolated, to which the electrical charge is applied from without. The upper beam with the glass thread can, by a micrometer screw, be lowered or elevated, so as either to touch the lower beam or hang suspended above it. Now, if an electrical charge is applied to the outside wire and to the lower beam, and if the upper beam, by screwing it down, is for a moment brought into slight contact with the lower one, the upper beam will be charged with the same electricity, and the movable upper beam will be driven off a certain number of degrees, according to the intensity of the charge."

The electricity is collected by a hollow ball of copper, with a metallic stem, the latter resting in a metallic tube, from which it is perfectly isolated by shellac. This collecting apparatus is fixed to a long pole, which is drawn up to the roof of the house, where the air circulates freely.*

The following is a sample of the record of the electrical and meteorological observations made by Dr. A. Wislizenus:

Day.	Hour.	Atmospheric electricity.	WIND.		Cloudiness.	Wet bulb.	Dry bulb.	Relative humidity.	Remarks.
			Direction.	Force.					
1861.									
Mar. 28 ..	9.00	+ 3	S. E.	1	5	58.5	50.5	53	Distant thunder almost constantly.
29 ..	6.00	- 45	S. E.	3	9	58	53.5	73	
		- 75							
		- 25							
		- 55							
	7.00	- 75	S.	3	10	61	57	77	A few drops of rain, Louder thunder; rain. Rain, thunder, and lightning. Rain, strong thunder, and lightning. Do. do.
		- 45							
	7.15	- 50							
	7.30	- 25							
		- 90							
	8.00	- 45	S.	2	10	61	58	83	Strong rain for half an hour. Clearing up a little.
	9.00	- 20	S. E.	2	9	64	60	77	
	12.00	- 30	W.	4	10	54	54	100	Strong rain, with thunder and lightning for several hours. Fine rain for short time.
	3.00	- 35	W.	4	10	50	49.5	96	
	6.00	+ 5	W.	4	10	45.5	43	80	
	9.30	+ 8	W.	3	10	44	41	76	

* Transactions of the Academy of Science, St. Louis, vol. 2, p. 4—1863.

The two following tables exhibit the general mean results, and the data from which the curves are constructed :

I.—Hourly means of positive atmospheric electricity at St. Louis, Missouri, in 1861–1870, based on daily observations at 6, 9, 12, 3, 6 and 9 o'clock, from morning till night, by A. Wislizenus, M. D.

Year.	6 a. m.	9 a. m.	12 m.	3 p. m.	6 p. m.	9 p. m.
1861.....	8.5	9.9	9.0	7.7	8.5	6.2
1862.....	8.9	10.0	9.1	7.3	8.1	6.2
1863.....	10.5	10.6	10.0	7.5	9.1	7.4
1864.....	7.9	8.8	7.4	5.4	5.9	5.5
1865.....	6.4	7.1	6.0	5.3	5.4	3.7
1866.....	5.5	6.2	5.2	4.5	5.2	4.4
1867.....	5.2	5.6	4.9	4.2	4.3	3.4
1868.....	2.7	3.0	2.7	2.2	2.5	1.9
1869.....	3.3	2.5	2.8	2.4	2.2	2.1
1870.....	4.7	5.3	4.3	3.6	5.0	3.9
Mean.....	6.4	7.0	6.1	5.0	5.7	4.7

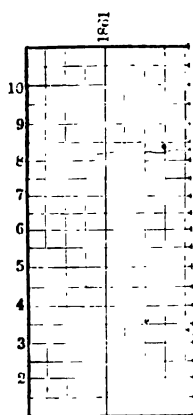
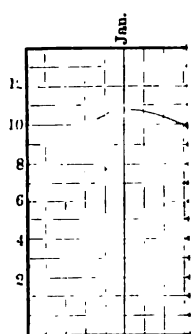
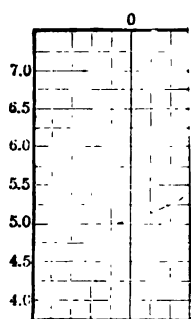
II.—Monthly and yearly means.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Mean.
1861.....	16.5	12.1	9.8	8.8	7.8	4.0	3.7	3.4	3.0	7.1	10.0	14.3	7.4
1862.....	12.1	16.0	9.4	10.6	7.5	3.0	2.2	2.3	3.0	7.7	12.6	13.9	7.4
1863.....	16.9	15.9	13.6	8.8	4.7	2.0	2.8	4.4	4.8	12.5	12.1	11.5	7.4
1864.....	15.8	11.3	11.0	8.5	5.1	4.0	2.3	0.9	1.8	5.4	6.6	9.0	6.7
1865.....	12.2	9.5	3.9	3.3	2.4	3.4	2.6	5.9	1.2	5.3	10.1	6.4	5.5
1866.....	5.9	8.1	5.7	2.1	3.3	2.1	2.4	5.1	3.2	7.0	10.2	7.0	4.6
1867.....	9.2	8.2	6.5	3.3	2.9	2.8	2.7	5.2	3.5	3.0	4.2	4.2	4.6
1868.....	4.1	5.0	2.5	1.7	1.1	0.4	0.5	0.4	1.4	2.6	4.3	6.3	3.3
1869.....	8.7	2.5	4.6	1.6	0.7	0.9	1.1	0.3	1.3	7.8	4.7	1.6	3.3
1870.....	8.6	10.2	5.5	6.9	5.0	1.3	0.8	0.4	0.1	0.1	5.9	8.7	4.7
Mean.....	11.0	9.9	7.4	5.6	4.0	2.4	2.1	2.8	2.3	5.8	8.0	8.3	5.7

Among the general results from these extended observations, Dr. Wislizenus deduces the following :

1. That our atmosphere is almost always charged with electricity; of 2,200 observations made in 1861, only 59 indicated zero, or a non-electric condition.
2. This electricity is almost always positive; of 2,124 observations, only 78 were negative.
3. This negative electricity appears generally in greater intensity than the positive, and is usually attended by (1) thunder-storms; (2) common rains, without thunder; or (3) high winds, without rains or thunder.
4. There is regular daily periodicity, with two maxima and two minima; the former at 9 a. m. and 6 p. m.; the latter at 3 p. m., and (probably) about midnight. (See curve of hourly means.)
5. The quantity of positive electricity is greatest in winter and least in summer, corresponding inversely, in this hemisphere, with the curve of temperature. (See curve of monthly means.)
6. It seems probable that there is also an annual periodicity, analogous to the periodicity of the sun-spots, the magnetic elements, and the aurora; this will be decided when the observations have been continued a few more years. (See curve of yearly means.)

With reference to the possibility of predicting the approach of storms from these electrical observations, Dr. Wislizenus writes that "he had, many times, occasion to observe how easily the equilibrium in the quantity of the usual atmospheric electricity is disturbed. Quite distant rain-falls and thunder-storms often made the electricity here disappear at once; still more so snow-falls. In the winter, when strong positive electricity, with fair and cold weather, suddenly declines, or disappears entirely, without any appreciable local cause, I have often predicted a contemporaneous considerable snow-fall at great distances, and the telegraph generally confirmed my supposition



from such localities as Cairo, Cincinnati, Chicago, Buffalo, and even New York. The accumulation of positive electricity there, as is usual with snow-falls, seemed to have produced a vacuum here. The sensibility of the electrometer in such changes is far greater than that of the barometer. Dry storms, too, of no great violence and of more local extent, affect often the electrometer, while the barometer scarcely shows any fluctuation. But in strong gales, that are invariably accompanied by sudden depression of the barometer, the electrometer confirms and corroborates the barometer by a sudden change into most intense negative electricity, lasting during the gale. The electrometer becomes thus a most valuable aid to the practical purposes of the barometer.”*

These very valuable and highly interesting results induced me to consult with Dr. Wislizenus as to the propriety and practicability of adding similar observations to those made by the sergeants of the Signal Corps; and it was found that though they might be of great service, yet the delicate nature of the instrument at present used and the difficulties of making the observations were such that they could not become general. If our electricians could devise some more simple and easily managed electrometer adapted for this purpose—especially one that would be self-registering—the object could be accomplished, and an additional certainty given to the daily conjectures of the “probabilities” of the occurrence of storms.

I. A. LAPHAM,
Assistant to the Chief Signal Officer.

MILWAUKEE, WISCONSIN, May, 1871.

PAPER 3.

List of disasters on the lakes during the months of November and December, 1870.

NOVEMBER.

1st.—James Burns, fireman on the tug J. H. Martin, lost overboard and drowned in the St. Clair River.

2d.—Bark Mary Amanda, ashore at Grand Haven, on Lake Michigan; got off without damage.

2d, (at night).—Schooner Ben Flint, struck by a sudden gale, was capsized, and lost on Big Point Sable; a complete wreck; the captain, Thomas Roberts, and a passenger, McCune, lost.

2d, (at night).—Schooner Mary M. Scott, ashore and lost, at Grand Island, Lake Superior.

2d, (at night).—Schooner Athenian, ashore at Grand Island, Lake Superior; pulled off, slightly injured.

2d.—Brig Starlight, with building-stone, encountered a gale, and slightly damaged.

3d.—Schooner Fleetwing, with iron ore, ashore at Cleveland; hull severely injured.

3d, (at night).—Brig Lucy J. Clark, considerably injured by collision with the bark Sweetheart.

Brig City of Tawas, with lumber, ran upon Colchester Reef, Lake Huron, and filled with water; got off.

Schooner Star of the North, with lumber, sprang a leak, and was towed to Grand Haven.

3d, (at night).—Schooner Jesse McDonald, ashore near Pictou, Lake Ontario, and pounded upon rocks; 1,800 bushels wheat damaged.

Schooner W. O. Brown, much damaged by collision with a propeller near Point au Barques, Lake Huron.

Brig Monitor, sustained damage in a gale on Lake Huron.

4th.—Tug Davidson, injured by striking an obstruction at Milwaukee.

4th.—Schooner Hero, ashore at Bailey's Harbor, Lake Michigan; filled with water; got off.

4th.—Scow William Kelly, lost on Lake Erie; seven lives lost.

4th.—Bark J. G. Marten, lost jib-boom at Chicago.

Schooner Oak Leaf, lost topsail on Lake Michigan.

Bark Jessie Hoyt, lost fore and main staysails on Lake Michigan.

Scow Windsor, struck a pile and sunk at Benton Harbor, on Lake Michigan.

Steamer Northwest, broke crank-pin, near Pointe Pelée; towed to Detroit.

Scow Ellen, drifted ashore at Port Clinton, Lake Erie; little damage.

4th, (8 p. m.).—Bark S. B. Pomroy, lost two seamen, William Mosher and Thomas Little, on Lake Superior.

Propeller Old Concord, damaged by striking the piers at Cleveland.

* Transactions of the Academy of Science, St. Louis, vol. 2, p. 293—1866.

Scow H. B. Rathbone, lost between 15,000 and 20,000 feet of lumber overboard on Lake Ontario.

Propeller H. G. Trusdell, burst cylinder off Sister Bay; towed to Green Bay.

Schooner Frank Perew, lost some canvas on Lake Michigan.

Schooner Atlanta and bark Naiad collided off Thunder Bay; damage \$3,000.

Brig Charles Napier, ashore at East Sister Island.

Schooner W. F. Allen, lost anchor, chains, &c., on Lake Michigan.

Scow Quickstep, ashore at Big Bay, got off without damage.

Propeller Schickluna, burned in the harbor at Port Colborne, Lake Erie.

Schooner Hornet, ashore and abandoned at Good Harbor, Lake Michigan.

Schooner William Young, on a reef at St. Helena; jettisoned 100 tons of coal.

A schooner ashore at North Manitou Island, Lake Michigan.

Schooner S. Robinson, waterlogged; towed to Beaver Harbor.

Schooner Frank D. Barker, lost main-boom.

Schooner Jefferson, ashore between Pentwater and Manistee, on Lake Michigan.

Schooner George Y. Foster, ashore between Pentwater and Manistee; buried in sand.

Scow White Oak, ashore between Pentwater and Manistee; got off without assistance.

Propeller Bruno, ashore on Chantry Island, Lake Huron.

Scow G. D. Wright, injured by collision with the bark Unadilla, near Point Sable, Lake Michigan.

5th.—Propeller St. Paul, struck a rock off Bar Point, Lake Erie; returned to Detroit for repairs.

6th.—Schooner J. C. Maxwell, leaking badly.

Schooner W. J. Preston, arrived at Milwaukee with center-board and main-gaff broken.

Schooner Bahama, leaking; jettisoned 100 tons coal; ashore near North Bay; got off.

Bark Red, White and Blue, lost spars on Lake Michigan.

Brig Waucoma, lost spars on Lake Michigan.

Bark John F. Warner, with cargo of iron, sunk near Mackinac.

Schooner Amaranth, lost small boat.

7th.—Tug Allen, lost upper works by fire at Toledo.

8th.—Schooner Quinlan, ashore at Toronto.

Forty-five vessels arrived at Chicago, all more or less damaged.

Schooner Melvina, injured by collision near the straits.

Schooner B. Eveleigh, supposed to be lost in this gale.

Schooner J. H. Hartzell, reached Oswego in a damaged condition; cargo wheat.

Two men lost from a fishing smack, on Lake Ontario, in a gale.

9th, (morning).—Scow John Lillie, struck the piers at Grand Haven, and was dashed to pieces.

9th.—Schooner Christie, damaged at Milwaukee.

Schooner Oswegatchie, jettisoned deck freight, mostly apples and salt, on Lake Ontario.

Bark Two Fannies, ashore at North Manitou Island; lost deck-load of lumber.

Schooner American Union, disabled at Beaver Harbor.

Steam barge Josephine, ashore at Kettle Point, Lake Huron.

Schooner Gem, ashore, and filled with water, at Clough's Pier, near Black River, Lake Erie.

Schooner Ellen Williams, struck a rock, causing a leak, in Sault Canal.

Scow R. D. Owen, lost jib at Sheboygan.

Bark Mary Jane, sprung a leak on Lake Michigan; cargo of corn damaged.

10th.—A trading schooner capsized off Little Point Sauble, Lake Michigan.

Schooners Ketchum and Albatross, damaged by collision with the barge Detroit.

11th.—The heavy sea delayed propellers crossing Lake Michigan from Milwaukee.

Schooner R. J. Sanburn, waterlogged at Kenosha.

Tug Admiral Porter, broke machinery off Two Rivers, Lake Michigan.

Bark Constitution, lost her bowsprit.

Bark Sunbury, run into the steam barge Empire off Charity Island, Lake Huron.

13th, (night).—Schooner Ariel, completely wrecked, on a shoal at Collingwood, in a gale.

Tug S. R. Kirby, broke her machinery near Port Austin, Lake Huron.

13th.—Propeller Annie L. Craig lost her top-mast on Lake Michigan.

Schooner Brooklyn, at Chicago, leaking badly.

Schooner Aunt Ruth, ashore near Dunkirk, Lake Erie; got off slightly damaged.

Brig Baltic, at Port Colborne with broken center-board.

13th, (night).—Many vessels found shelter, and were delayed in Milwaukee from blustering rain-storm.

Bark Sweetheart, disabled by collision and towed to Chicago.

Schooner Mary Ann Rankin, wrecked near Port Colborne.

14th.—Four vessels—steamer Alpena, schooners Florence, Ebenezer, and Guide—
injured by collision at Chicago.

Schooner J. R. Bentley ashore at St. Helena Reef, near Mackinac; lost 1,200 bushels
wheat.

Tug Union destroyed by fire at Saginaw Bay.

Propeller Roanoke, steam-barge Eupire, and a schooner, grounded on the St. Clair
Flats, obstructing the channel.

15th.—Brig Fanny Gardner, at Chicago, in a leaky condition.

Tug Babcock damaged her engine at Chicago.

Tug Harrison broke her crank-pin at Chicago.

Steamer Algoma, at Copper Harbor, Lake Superior, with broken wheel.

Schooner Lillian lost one of her crew near Galloo light, Lake Ontario.

Bark H. C. Winslow lost her second mate on Lake Huron.

A fishing-boat capsized and three men lost at Au Sable, Lake Huron, in a squall
that lasted but a few minutes.

15th, (at 11 p. m.)—Bark Badger State, with wood, wrecked on Sleeping Bear Point,
Lake Michigan; total loss.

16th.—Steam-barge Empire ashore and lost, off Port Huron, Lake Huron.

Propeller Wade's upper works damaged by collision at Chicago.

Scow Tuttle damaged by collision on the Detroit River.

S. W. Mason was drowned by upsetting of a sail-boat on Lake Ontario.

17th.—Propeller left Milwaukee for Grand Haven, but returned on account of heavy
sea.

Schooner G. D. Donsman at Chicago in a leaky condition; docked for repairs.

Schooner Lillie Parsons injured by collision in the Welland Canal.

17th, (at night.)—Propeller Chicago sprung a leak, in a heavy northwest gale near Point
Aux Bees Scies, Lake Michigan; wheat and flour damaged.

17th, (7½ p. m.)—Schooner Elbe, with wood, struck a rock near Centerville, filled with
water and capsized; towed to Manitowoc.

18th.—Schooner Walhalla, ran back to Milwaukee in a damaged condition.

Schooner Golden Rule broke center-board near Sheboygan, and returned to Milwaukee.

A bark loading with iron ore at Bear Creek, for Charlotte, broke loose and was
driven ashore.

19th.—Schooner Reindeer ashore near Pinepog River; high and dry.

19th, (night.)—Schooner Yankee Trader ashore at Manitowoc; little damage.

19th, (evening.)—Schooner Norway ashore at Muskegon, Lake Michigan.

Schooner Hanna, with lumber, capsized off Milwaukee; was towed in.

Scow Southside ashore at Whitehall, Lake Michigan; abandoned for the winter.

19th.—Propeller Prairie State on a reef near Pointe Pelée; jettisoned 25 tons cargo.

Schooner Rob Roy waterlogged near Holland, on Lake Michigan.

Schooner George L. Wen struck an obstruction while entering the Welland Canal;
3,000 bushels grain wet.

Schooner Alpha grounded on a bar at Presque Isle.

Schooner Floretta damaged by a squall, twenty-two miles from Marquette, Lake
Superior.

20th.—Propeller Detroit aground in the Detroit River; pulled off.

Schooner Prince Edward ashore at Isle Cove; not off.

Steamer Dolphin aground on the St. Clair Flats; pulled off.

Schooner Mary Morton ashore on Long Point, Lake Erie; total loss; cargo, coal.

21st.—Schooner Morning Star sprung a leak on Lake Ontario; 3,000 bushels barley
damaged.

Schooner John Jewett sunk by collision with the barge E. L. Coyne, on the flats.

Propeller Georgiana pounded on a shoal near Kingston; little damage.

Tugs Armstrong and Tiger destroyed by fire in the river below Bay City.

Barge B. F. Sears, totally wrecked at Port Rowan.

Schooners Winnie Wing and Maine slightly damaged by collision.

Schooner Areturus lost anchor on Lake Huron.

Steamer Metropolis had a hole stove in her upper works; damage slight.

Bark C. J. Wells arrived at Detroit damaged; docked for repairs.

Propeller Cleveland returned to Manitowoc slightly damaged.

22d.—Schooner Tidy Adly disabled near Sleeping Bear Point, Lake Michigan.

22d, (night.)—Brig Mohegan driven ashore in a snow-storm at Point au Barques.

Schooner Margaret Drayton struck the piles at Racine; damage slight.

Steamer Alpena grounded on the bar at Grand Haven, and narrowly escaped going
ashore.

Propeller Galena on a bar at Sandusky; got off.

Schooner Lucy, with grain, at St. Catharine's in a leaky condition.

24th.—Schooner David Hull damaged on Lake Michigan.

Schooner Ida lost her center-board on Lake Michigan.

Schooner Sunnyside ashore at Whitehall.
 Schooner Julia Willard ashore at Toronto Point, Lake Ontario; damage slight.
 25th, (night).—Schooner R. H. Becker ashore at Muskegon, Lake Michigan; got off.
 Schooner Dolphiu ashore at Muskegon, Lake Michigan.
 Scow Southside ashore, high and dry, at Whitehall.
 Schooner Montpelier ran ashore in a blinding snow-storm near Port Edwards, Lake Huron.
 Scow Fairy Queen ashore at South Haven, Lake Michigan; could not be got off.
 Schooner Dauntless, with iron ore, ashore at St. Martin's Island, Lake Michigan; stripped and abandoned.
 25th.—Bark James Bell, schooner Sigel, and scow Trio damaged by collision at Chicago.
 Schooner Gazelle, with wheat and barley, delayed and damaged by gale.
 Schooner Geo. W. Hoyt lost her jib-boom on Lake Superior.
 Schooner Sweepstakes ashore at Port Nelson, Lake Michigan; off without damage.
 28th.—Bark Lafrinier and schooner Millard Fillmore ashore at Grand Traverse Bay, Lake Michigan.
 A Canadian schooner, with grain, ashore, east coast of Lake Huron; probably total loss.
 Tug Mayflower aground in the Detroit River.
 Schooner Governor damaged by collision with schooner Frank D. Baker, below Cape Vincent.
 Bark Henry Bissell ashore at Pointe au Pelée, Lake Erie; filled with water; 8,000 bushels wheat wet; got off much damaged.
 28th, 29th.—Bark Chicago Board of Trade ashore at Milwaukee; got off materially damaged.
 Schooner Seneca Chief injured the schooner Julia Palmer and the scow Home by collision at Milwaukee.
 Schooner Alnwick ashore at Racine; got off.
 Propeller Susquehanna upon a reef at North Bay, Lake Michigan; 500 barrels flour lost; got off, much damaged.
 Schooner Libbia Nau, with iron ore, aground at Green Bay.
 29th.—Schooner Annie Vought aground at Chicago; pulled off.
 Schooners Tempest, Dolphin, Jamaica, Collingwood, Hattie Earl, and Reciprocity, the tug Preston Beasley, and the propeller Sun, suffered damage by collision during the storm at Chicago.
 Propeller Galena hard aground on the St. Clair Flats.
 Schooner Wanderer damaged by collision at mouth of the Detroit River.
 Brig Mohega ashore at Pointe au Barques, and completely broken up.
 Schooner W. A. Chisholm ashore at Northeast Point, Pennsylvania.
 Schooner S. Robinson, with lumber, struck a rock and filled with water at Perry's Sound, Georgian Bay, Lake Huron.
 Schooner Pierrepoint, with groceries, &c., supposed lost on Lake Superior.
 Schooner Hattie Johnson lost her center-board on Lake Erie.
 30th.—Schooner Tartar ashore, a total wreck, at Pointe au Pelée, Lake Erie.
 Schooner D. McInnes, with coal, supposed to be lost.
 Schooner Rainbow sprung a leak off the Ducks, Lake Ontario; 200 bushels barley damaged.
 Schooner Cornelia, at Chicago, in a leaky condition.
 Two fishermen drowned at the entrance of Green Bay.
 Propeller Salina aground on the St. Clair Flats.

DECEMBER.

1st.—A sailor washed overboard and drowned, at Port Colborne.
 Brig Frankie Wilcox, leaking and in distress, near Long Point, Lake Erie.
 5th.—Bark City of Buffalo injured by collision with the schooner C. P. Marsh at Cleveland, during a sudden squall.
 Scow Christie lost her jib-boom.
 Scow Mendota lost her rudder on Lake Michigan.
 A schooner off Port Ontario went down in a storm; entire crew lost.
 16th.—Schooner Napoleon ashore at Manistee; got off with little damage.
 28th.—Propeller Ironsides disabled by loosening a wheel on Lake Michigan.
 Two scows broke loose from their moorings and floated into the lake at Charlevoix, Michigan.

Recapitulation, and comparison with the same months in 1869.

	1869.	1870.
Wrecked and lost	39	18
Destroyed by fire	4	3
Sunk	6	2
Capsized	3	3
Leaking	23	17
Damaged by collision	42	32
Ashore, grounded, &c.	111	59
Damaged	138	99
Total	366	233
Men lost	97	23

PAPER 4.

INSTRUCTIONS TO OBSERVER-SERGEANTS, SIGNAL SERVICE, UNITED STATES ARMY, ON DUTY AT STATIONS.

1. Each observer, upon arriving at his station, will immediately proceed to secure a room suitable for office purposes, and the storage of instruments and other United States property in his charge. This room must be in the immediate vicinity of the telegraph office charged with the transmission and receipt of the weather reports, and should be in the upper story of a building, and contain at least *one* window facing the north. In all cases he will endeavor to get permission to occupy the roof of the (or a) building for the necessary exposure of his instruments, and the erection of an instrument-room, in accordance with the plans furnished by this office. When such permission cannot be obtained, or a suitable roof found, an instrument shelter will be constructed, similar to the one described on page 2 of the Smithsonian Directions for taking Meteorological Observations, a copy of which is furnished each observer, when ordered to a station.

The building selected should be detached from other buildings, and, where this cannot be had, should be higher than those surrounding it.

Too much attention cannot be given to the proper setting up of the instruments and their protection from local influences.

2. An observer, upon arriving at his station, will, as soon as practicable, put himself in communication with the meteorological committee of the board of trade, chamber of commerce, or board of underwriters, and such other committees as may desire to co-operate with this office, and also with all colleges, scientific associations, and other institutions of learning. He must bear constantly in mind that it is expected he will use every effort in his power to render his office of the greatest public utility.

3. The office furniture will be of the plainest kind, and consist of such articles only as are absolutely necessary for the proper transaction of business. The room, furniture, and instruments must be kept neat and clean at all times, and prepared for inspection.

4. The regular reports from station No. — will commence with the morning report of —, and from and after that date three observations will be made daily, for transmission, by telegraph, to —, and three observations, at different hours, for transmission by mail, weekly, to this office.

5. The observations for telegraphic transmission will be entered in Forms 1 and 5, supplied by this office, and made at — a. m., — p. m., and — m., daily. The instruments will be read in the following order :

- | | | |
|----------------|-----------------|----------------|
| 1. Barometer. | 2. Thermometer. | 3. Hygrometer. |
| 4. Anemometer. | 5. Anemoscope. | 6. Rain-gauge. |

These observations will also be entered in the daily record of observations and in the record of bulletins, and a weekly record of them, on Form 4, will be sent to this office.

6. The reports will be handed in person to the operator charged with their transmission, in the order and at the times named below, viz : Report No. 1, (on Form 1, 20 words,) at — a. m. ; report No. 2, (on Form 5, 10 words,) at — p. m. ; report No. 3, (on Form 5, 10 words,) at — m.

7. Observers will be at the telegraph office, with the reports carefully and plainly written out in *duplicate*, ten minutes before the hours named, in order that the operator may be notified in time to prepare for their transmission, and will obtain the signature of the operator to *both* copies of *each* report. They will also furnish the manager of the office with a plainly written list of the stations (with their proper telegraphic numbers) from which reports are to be received, and also of those to be sent from his office, with the names of the stations to which they are to be sent. If reports are to be transferred, or selected for transfer at any station, the observer at that station must personally attend to such transfer or selec-

tion, unless prevented by sickness or other extraordinary cause. To provide against such an event, he will so arrange with and instruct the manager that the regular transmission of reports will not be interrupted by his absence.

8. The following is a list of stations, with their proper telegraphic numbers. Those to be received at station No. — are underlined in red ink, and any failure to receive these will be promptly reported to this office, with a statement of the probable cause of failure.

Station.	No.	Station.	No.
Plaister Cove, Nova Scotia.....	10	.....	56
St. John's, New Brunswick.....	11	.....	57
Portland, Maine.....	12	.....	58
Boston, Massachusetts.....	13	.....	59
New London, Connecticut.....	14	.....	60
New York City, New York.....	15	Jackson, Mississippi.....	61
Albany, New York.....	16	Memphis, Tennessee.....	62
Philadelphia, Pennsylvania.....	17	Nashville, Tennessee.....	63
Baltimore, Maryland.....	18	Louisville, Kentucky.....	64
Washington, District of Columbia.....	19	Cincinnati, Ohio.....	65
Wilmington, North Carolina.....	20	St. Louis, Missouri.....	66
Charleston, South Carolina.....	21	Omaha, Nebraska.....	67
Savannah, Georgia.....	22	Cheyenne, Wyoming Territory.....	68
Augusta, Georgia.....	23	Santa Fé, New Mexico.....	69
Lake City, Florida.....	24	Corinne, Utah.....	70
Key West, Florida.....	25	Fort Benton, Montana Territory.....	71
Montgomery, Alabama.....	26	.....	72
Mobile, Alabama.....	27	.....	73
New Orleans, Louisiana.....	28	.....	74
San Francisco, California.....	29	.....	75
Norfolk, Virginia.....	30	.....	76
Oswego, New York.....	31	.....	77
Rochester, New York.....	32	.....	78
Buffalo, New York.....	33	.....	79
Cleveland, Ohio.....	34	.....	80
Toledo, Ohio.....	35	.....	81
Detroit, Michigan.....	36	.....	82
Chicago, Illinois.....	37	.....	83
Milwaukee, Wisconsin.....	38	.....	84
St. Paul, Minnesota.....	39	.....	85
Du Luth, Minnesota.....	40	.....	86
Pittsburgh, Pennsylvania.....	41	.....	87
Knoxville, Tennessee.....	42	.....	88
Indianapolis, Indiana.....	43	.....	89
.....	44	.....	90
.....	45	.....	91
.....	46	.....	92
.....	47	.....	93
.....	48	.....	94
.....	49	.....	95
.....	50	.....	96
.....	51	.....	97
.....	52	.....	98
.....	53	.....	99
.....	54	.....	100
.....	55	.....	101

9. In addition to the observations made for telegraphic transmission, three others will be taken daily, at 7 a. m., 2 p. m., and 9 p. m., (local time,) respectively. These will be recorded upon Form 4, in the same manner as the telegraphic observations, but on a separate sheet, and a copy of them will be forwarded weekly, by mail, to the office of the Chief Signal Officer.

10. After delivering his own reports to the operator, each observer will remain in the telegraph office until they are sent to their proper destination, and until the reports from other stations, intended for use at his station, are received, or until assured that their receipt has been prevented by some cause beyond the control of the operator. The reports for station No. — should be received by — a. m., — p. m., and — m., respectively; and when they are delayed beyond these hours, the facts should, in all cases, be promptly reported to this office by mail, with a statement of the cause of delay, when known.

11. The telegraph offices at which the reports are received will be kept constantly supplied by the observers with Form 2, and, in all cases, the receiving operator will be required to fill in the date and time of receipt. Observers will, in like manner, fill up Forms 1 and 5 before delivery.

12. Reports will be made on Sundays at the regular hours, and the same punctuality in delivering them at the telegraph offices will be required.

13. Immediately upon the receipt of the morning reports at any station, the observer will take them to his office, and translate them into ordinary language. He will then write out plainly, on manifold paper, when necessary, a copy for each evening newspaper published at his station, the editor of which desires it for publication, and will furnish it promptly and regularly to such newspapers. He will also fill up properly the bulletin sheet, (Form No. 3,) using the manifold issue, and post this regularly in the rooms of the board of trade, chamber of commerce, and such other conspicuous places as may have been officially designated. The local observations will invariably be entered in all bulletins, press-reports, and maps. At stations supplied with the manifold-maps, these will follow the bulletins, and be printed as rapidly as practicable, and furnished to such parties as may be designated by this office. The "War Department Weather-Map" will then be changed in accordance with the following key:

The index consists of an arrow, disk, and card, which show the direction and velocity of the wind, state of the weather, height of the barometer, and height of the thermometer at the place on which they are affixed. The index will be changed once daily, at 10 a. m., or as near that hour as is practicable. The arrow flies with the wind.

A red disk indicates clear weather.

A blue disk indicates sky covered with clouds.

A $\frac{1}{2}$ blue disk indicates sky $\frac{1}{2}$ covered with clouds.

A $\frac{1}{3}$ blue disk indicates sky $\frac{1}{3}$ covered with clouds.

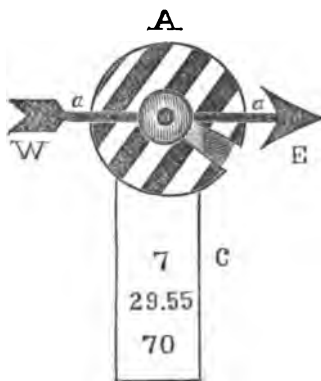
A $\frac{2}{3}$ blue disk indicates sky $\frac{2}{3}$ covered with clouds.

A black disk indicates rain.

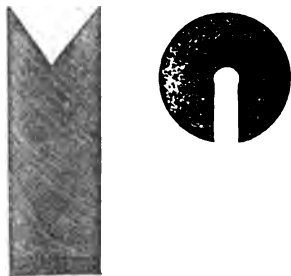
A white and black barred disk indicates snow.

A yellow card projecting below the disk, and held in position by the same screw that fastens the arrow and disk, shows the velocity of the wind in miles per hour, the height of the barometer in inches and hundredths, and the height of the thermometer in degrees Fahrenheit.

EXAMPLE.



The barred disk A indicates snow, and the position of the arrow a a that the wind is blowing from the west. The upper figure on the card, c, shows that the velocity with which the wind is blowing is seven miles per hour. The height of the barometer, shown by the middle figures, is twenty-nine inches and fifty-five hundredths, while the height of the thermometer, indicated by the lower figures, is seventy degrees above zero. When the temperature is below zero the minus sign should always be prefixed. To facilitate changing the disks and cards they are cut so as to slip on and off without removing the clamp, as shown in the following figures:



14. The afternoon reports will be received and translated in the same manner, but will be bulletined only, and at such places as will insure the greatest publicity.

15. The night reports, after translation, will be carefully and promptly written out on manifold-paper, and furnished to each morning paper printed at the station, in time for publication. Observers will endeavor to arrange with the publishers to have the reports taken from the observer's office; but where this arrangement cannot be effected, the observer will deliver them in person at the different newspaper offices.

16. At stations where the publishers of newspapers desire to have all the reports of the previous day, they will be supplied by the observers on the manifold-form issued by this office for that purpose. In such cases, observers will write up the morning and afternoon reports during the day and evening, so that there will be no delay in getting out the full report at midnight. In filling out the heading of the daily bulletin, for publication, the time of the reports will be the exact local time of the place of publication, and will be so stated at all stations. In carrying out that part of their duty which relates to the publication and distribution of reports, observers will be required to act promptly and intelligently, as the usefulness of the reports depends wholly upon the speed and accuracy with which they are laid before the public.

INSTRUMENTS.

17. Each station will be supplied with one of Green's standard barometers, one thermometer, one hygrometer, one wind-vane, one rain-gauge, one Robinson anemometer, and one clock.

BAROMETER.

18. The barometers will in all cases be carefully compared with the standard at this office before issue, and the amount of instrumental error will be sent with each.

The barometer should be placed in a room of a temperature as uniform as possible, not heated nor too much exposed to the sun. It should be suspended at the height of the eye near a window, in such a manner as to be lighted perfectly without exposure either to the direct rays of the sun or to the currents of air which are always found at the window-casings doors. To protect the instrument from external injuries, from dust, and from the direct radiation of warm bodies or the currents of air from the window, observers will fasten the wooden case in which it is carried firmly against the wall in a vertical position near the window, in such a manner that the cover will open in a direction parallel to the panes. An opening large enough to admit the tube of the barometer will be cut in the upper end of the box; and directly above this, at the distance of one inch, a strong hook will be driven into the wall. This hook should extend two or three inches beyond the box, and upon it the instrument will be suspended. When not in use the cover will be closed; but when an observation is to be taken it will be opened, and the instrument drawn out on the hook, clear of the box, and in the full light of the window. After the observation is made the barometer will be slipped back into the box.

19. All readings of the barometer taken for telegraphic transmission will be corrected by the observer making the observation, for *temperature*, for *elevation*, and for *instrumental* error, before they are sent from his station. In correcting for temperature, the reading of the *attached* thermometer will be used, while in correcting for elevation, the temperature used will be that of the exposed or open-air thermometer.

In correcting for elevation, the height of the surface of the mercury in the cistern of the barometer above the ground must be added, in all cases, to the height of the station above sea-level, as in the following example, viz: Suppose height of station above sea-level to be 670 feet; height of mercury (surface) in cistern to be 17 feet; then the elevation to be corrected for would be 687 feet.

In correcting for temperature, Table XVII, pages 66 to 71, paper C, of Guyot's tables, will be used; and for elevation, Table XIX, page 92, paper D, of the same book, when special tables, prepared at this office, are not furnished.

20. In transporting a barometer, even across a room, it should be screwed up, and carried with its cistern uppermost; for traveling, it is provided with a wooden case. On steamboats or railroads it should be hung up by a hook in the state-room or car, and the lower end firmly strapped to the side of the room or car to prevent jarring; in wheeled vehicles, it should be carried by hand, supported by a strap over the shoulder, or held upright between the legs, but it should *not* be allowed to rest on the floor of the carriage, for a sudden jolt might break the tube. If carried on horseback, it should be strapped over the shoulders of the rider, where it is not likely to be injured, unless the animal is subject to a sudden change of gait. When about to be used, it should be taken from its case, and, while screwed up, gently inverted and hung up, when it can be unscrewed. While it has its cistern uppermost, the tube is full, is one solid mass of metal and glass, and not easily injured; but when hung up, a sudden jolt might send a bubble of air into the vacuum at the upper end of the tube, and the instrument would be useless until repaired.

If the cistern should become dirty, it can be cleaned with safety, and without changing, in the slightest degree, the zero of the instrument. Everything used in the operation must be clean and dry; avoid blowing upon any of the parts, as the moisture from the breath is injurious.

The instrument being placed upright, the cistern uppermost, unscrew and take off the brass casing which incloses the wooden and leathern part of the cistern. This wooden part (which has the grain crosswise, and therefore is not air-tight) is made in two pieces, fastened together by four screws and four brass pieces, each in the form of a half of a circular ring. It will be necessary to take out two of these screws, and loosen the other two, when the brass pieces can be taken off; the upper wooden piece, to which the bag is attached, can then be lifted off, and the mercury will be exposed; by then inclining the instrument a little, a portion of the mercury in the cistern may be poured out into a clean vessel at hand to receive it, when the end of the tube will be uncovered. This is to be closed by the *gloved hand*, when the instrument can be inverted, the cistern emptied, and the tube brought again to its upright position; great care must be taken not to permit any mercury to pass out of the tube. The long screws which fasten the glass portion of the cistern to the other parts can then be taken off, the various parts wiped with a clean cloth or handkerchief, and restored to their former positions. The mercury which had been taken out of the cistern must now be cleaned, or it must be replaced by other that is clean and pure; if the old mercury is merely dusty, or dimmed by a film of oxide, the cleaning may be effected by straining it through a chamois leather, or through a funnel with a capillary hole at the end, of a size to admit of the passage of but a small thread of the metal; such a funnel is conveniently made of letter-paper. The dust will adhere to the skin or paper, and the filtered mercury will present a clean and bright appearance; if chemically impure, it should be rejected, and fresh, clean mercury used. With such clean mercury, the cistern should be filled as nearly full as possible; the wooden portions put together, and securely fastened by the screws and clamps; the brass casing screwed on, and the screw at its end screwed up; the instrument can then be hung up and readjusted. The tube and its contents having been undisturbed, the instrument should read the same as before. If a little mercury has been lost during the operation, and there is none at hand to replace it, no serious harm has been done; but if much is lost, the open end of the tube may become exposed in inverting the instrument, in which case air may enter.

THERMOMETER.

21. The thermometer should be hung in the open air facing the north in such a manner that it will always be in the shade, and at least one foot from the wall of the building to which the shelter is attached, where the Smithsonian form of shelter is used. It must be protected against the light reflected from surrounding objects, and from rain, snow, and hail. The instrument must be placed exactly perpendicular, the middle of the scale being at the height of the eye in order to prevent error in reading. The readings should be made at all times, and, especially in the winter, *through the panes*, without opening the window, when the shelter is built out from a window. When the shelter is built upon a roof, great care must be exercised in making the readings in order to prevent the instrument from being affected by the heat of the body or of the lantern at night. The observation must be made as rapidly as is consistent with accuracy.

HYGROMETER.

22. The hygrometer will be placed in the same shelter as the thermometer, and at a distance of one foot from it. The cistern will be kept supplied with pure water at all times when the temperature of the air is above the freezing-point, and the muslin cover of the wet-bulb will be changed every two months, and the bulb carefully cleaned. The muslin may be washed as often as necessary, without removal, by means of a jet of clean water from a small syringe.

When the temperature of the air is below the freezing-point, the water will be emptied from the cistern, and the wet-bulb will be moistened with cold water by means of a camel's-hair brush fifteen minutes before the observation is made, or long enough to permit the ice to form and *dry* on the bulb. The coating of ice allowed to form should be very thin, otherwise the reading will be inaccurate. Alcohol must not be used to prevent the water from freezing. The reading must be made rapidly, and without opening the window. The relative humidity of the air will be obtained from Table VII, page 46, paper B, of Guyot's tables.

ANEMOMETER.

23. The anemometer will be fixed in a vertical position upon a post of sufficient height to bring the dial on a level with the eye of the observer, and will be in an exposed situation, so as to receive the full force of the wind. When possible, this post should be framed into the roof, to steady it and prevent the instrument from vibrating; but when this cannot be done, it should be framed at the bottom into two pieces of scantling, not less than three feet in length, which cross each other at right angles, and which can be nailed fast to the roof or platform upon which the instrument is placed. Short braces can be added when necessary to insure steadiness. The outer dial of the instrument is graduated in miles and tenths of miles—the figures 1, 2, 3, &c., indicating miles, and the subdivisions tenths. One complete

revolution of this dial is equivalent to ten miles of wind, and carries the inner dial forward one subdivision. This inner dial registers up to one thousand miles, and moving so slowly, will not be used in making ordinary observations, but will be noted by observers daily when making the 7 a. m. observation. To make an observation, two readings of the outer dial must be taken, with an interval of five minutes between them, and the *difference* between these readings will be the distance in tenths of miles traveled by the wind in that interval. This, multiplied by twelve and divided by ten, will give the proximate velocity in miles per hour. Example: Suppose the index of the outer dial to be at 3 when the first reading is taken, and at 3.6 five minutes after, the difference, 6, is the distance traveled in that time; and this, multiplied by twelve and divided by ten, gives a velocity of seven and two-tenths miles per hour. Whole numbers only will be used in expressing the velocity. When the decimal is greater than five-tenths, the unit's figure will be increased by one; when five or less, it will be thrown out. The whole distance traveled by the wind in any twenty-four hours, provided it does not exceed one thousand miles, will be obtained from the inner dial by a double observation as above, making the interval twenty-four hours instead of five minutes, and will be entered on the copy of Form 4 used for the local observations.

WIND-VANE.

24. The wind-vane should be set in a place as free and open as possible, in order that the wind may act freely upon it, and must never be sheltered by surrounding buildings or other objects. Observers will mark, with the aid of a compass, at the base of the upright which supports the vane, the true meridian of their respective stations. The magnetic variation at station No. — is — degrees.

The observation of the vane requires more care than is usually given. In winds of considerable strength the vane is never at rest, or fixed in the same direction; it oscillates incessantly, and its oscillations increase in extent with certain winds and with the violence of the wind. In such cases observers must *note the mean* direction between the extremes. When the wind is too light to move the vane, and when it is calm, no direction will be given in the report, but the space will be filled with the word "Naught." The attention of observers is called to this matter in order to prevent them from recording direction of wind when it is calm. The direction of the wind will be designated by the eight principal points of the compass, beginning with the north and moving around by the eastward, and numbered from one to eight respectively.

RAIN-GAUGE.

25. The rain-gauge will be placed, whenever practicable, with the top of the funnel-shaped collector twelve inches above the surface of the ground, firmly fixed in a vertical position, and protected from the interference of unauthorized persons. It will be examined daily, at the time of making the morning observation; the amount of water it contains carefully measured by means of the graduated rod sent with each gauge, and then emptied and returned to its proper position. When a position at the level of the ground cannot be found with a sufficiently clear exposure the gauge will be placed on the top of the instrument-room, or roof of the building occupied by the observer, who will measure the height above the ground and report it to this office. The measuring rod is graduated in inches and tenths of inches, and the proportion between the cylinder and funnel is as ten to one, so that ten inches upon the rod correspond with one inch of actual rain-fall, one inch on the rod to one tenth of rain, and one-tenth on the rod to one-hundredth of rain. Snow will be melted and then measured and reported in the same manner as rain, but the fact of its being melted snow must be noted under the head of remarks, in the weekly reports, on Form 4.

TOOL-BOX.

26. For repairing and putting in order a barometer, the following implements are furnished, neatly packed in a small box:

A couple of screw-drivers, one fitting the screws about the cistern, the other those about the scale; a small glass funnel; two porcelain cups, from two to four inches in diameter; kid-skin; shoemaker's thread; white wax; chamois leather; a pair of small forceps; a small three-cornered file, and a blow-pipe.

CLOCK.

27. The clock will be hung upon the interior wall of the room occupied as an office, and at each station will be adjusted to the local time.

Immediately after placing his instruments in position, each observer will make out and forward to the Chief Signal Officer at Washington a full report in writing, stating the kind, size, and position of room selected; the street, and number of the building in which the room is situated; the position of each instrument, and height of each above the ground. In giving height of the barometer the measurement will be made from the surface of the mercury in the cistern.

In addition to this information, such other facts will be stated as will enable the Chief Signal Officer to judge of the manner in which this part of the observer's duty has been performed.

FORMS.

28. The following-named forms will be furnished to each station :

- Form 1. Morning report.
- Form 2. Receiving sheet.
- Form 3. Bulletin.
- Form 4. Weekly report.
- Form 5. Afternoon and night reports.
- Form 6. Receipt for property.
- Form 7. Press report.
- Form 8. Manifold map.

29. Form 1 will be used for the morning report of twenty (20) words, and will be filed up as follows :

In the first line the first three figures will show the height of the barometer, and the last two the number of the station. The barometer will be read to hundredths ; and in filling up this form the first figure of the height in inches will be omitted.

In the second line the first two figures will show the reading of the exposed thermometer — ; the next two, the relative humidity, and the last one the direction of the wind, indicated by a series of numbers from one to eight, beginning at the north and moving around by the eastward. A *calm* will be indicated by the word *Naught*.

In the third line the first two figures will show the velocity of the wind in miles per hour, the next two the date of the report, and the last figure the state of the weather, indicated by a series of numbers from naught to nine, inclusive, as follows :

- Naught will indicate clear weather.
- One will indicate fair weather.
- Two will indicate cloudy weather.
- Three will indicate clearing up after storm.
- Four will indicate threatening to storm soon.
- Five will indicate light rain.
- Six will indicate heavy rain.
- Seven will indicate light snow.
- Eight will indicate heavy snow.
- Nine will indicate hail or sleet.

From the first to the ninth day, inclusive, of each month, the first of the two spaces assigned to the date will also be filled with the word "Naught."

The first space in the fourth line will be used to indicate the amount and kind of the *upper* clouds, by the following scale :

- Naught will indicate a clear sky.
- One will indicate atmosphere hazy.
- Two will indicate sky 1-4 to 2-4 covered with cirrus clouds.
- Three will indicate sky 3-4 to 4-4 covered with cirrus clouds.
- Four will indicate sky 1-4 to 2-4 covered with cumulus clouds.
- Five will indicate sky 3-4 to 4-4 covered with cumulus clouds.
- The word "Blank" will indicate that the upper clouds are hidden.

The second space in the fourth line will be used to indicate the amount and kind of *lower* clouds, by the following scale :

- Naught will indicate absence of lower clouds.
- One will indicate fog.
- Two will indicate sky 1-4 to 2-4 covered with stratus clouds.
- Three will indicate sky 3-4 to 4-4 covered with stratus clouds.
- Four will indicate sky 1-4 to 2-4 covered with nimbus clouds.
- Five will indicate sky 3-4 to 4-4 covered with nimbus clouds.
- The word "Blank" will indicate that the lower clouds are hidden.

The three last figures will show the amount of rain-fall, or of melted snow, in the past twenty-four hours, in inches and hundredths of an inch. When there is no rain-fall to report, the spaces will be filled with the word "Naught." This form must be filled in duplicate, as previously directed, and the printed instructions upon it must be strictly followed, and observers must assure themselves that they are clearly understood by the operators charged with their transmission. Whenever the margin at the right is too narrow to permit the figures to be duplicated in the customary manner, these figures may be written *across* the end of the paper, but should never be omitted.

30. Form 5 will be used for the afternoon and night reports of ten words and two supplementary letters each, and will be filled up as follows : The first line will show height of barometer and number of station, as in Form 1, followed by the letter "D" in the afternoon report, and the letter "N" in the night report. The first figure of the second line will show

the direction of the wind by the same series of numbers used in Form 1. The second figure will show the velocity of the wind in miles per hour as follows:

	Pressure—pounds per square foot.		Pressure—pounds per square foot.
A velocity of 1 mile by Ono	0.00	A velocity of 31 miles by Fail	4.80
A velocity of 2 miles by Two .....	.02	A velocity of 32 miles by Feed	5.12
A velocity of 3 miles by Three .....	.04	A velocity of 33 miles by Flea	5.44
A velocity of 4 miles by Four .....	.08	A velocity of 34 miles by Foam	5.76
A velocity of 5 miles by Five .....	.12	A velocity of 35 miles by Fray	6.12
A velocity of 6 miles by Six .....	.18	A velocity of 36 miles by Hark	6.48
A velocity of 7 miles by Seven .....	.24	A velocity of 37 miles by High	6.84
A velocity of 8 miles by Eight .....	.32	A velocity of 38 miles by Hope	7.22
A velocity of 9 miles by Nine .....	.40	A velocity of 39 miles by Hugs	7.60
A velocity of 10 miles by Ten .....	.50	A velocity of 40 miles by Hyde	8.00
A velocity of 11 miles by Ace .....	.60	A velocity of 41 miles by Maid	8.40
A velocity of 12 miles by Age .....	.72	A velocity of 42 miles by Mean	8.82
A velocity of 13 miles by Alas .....	.84	A velocity of 43 miles by Mile	9.24
A velocity of 14 miles by Amen .....	.96	A velocity of 44 miles by Mode	9.68
A velocity of 15 miles by Bay	1.12	A velocity of 45 miles by Muck	10.12
A velocity of 16 miles by Anna	1.28	A velocity of 46 miles by Nag	10.56
A velocity of 17 miles by Bang	1.44	A velocity of 47 miles by Nero	11.04
A velocity of 18 miles by Beam	1.62	A velocity of 48 miles by New	11.52
A velocity of 19 miles by Bird	1.80	A velocity of 49 miles by Note	12.00
A velocity of 20 miles by Blue	2.00	A velocity of 50 miles by Nude	12.50
A velocity of 21 miles by Cane	2.20	A velocity of 51 miles by Raid	13.00
A velocity of 22 miles by Card	2.42	A velocity of 52 miles by Rate	13.52
A velocity of 23 miles by Cole	2.64	A velocity of 53 miles by Read	14.04
A velocity of 24 miles by Crab	2.88	A velocity of 54 miles by Ride	14.58
A velocity of 25 miles by Cube	3.12	A velocity of 55 miles by Ring	15.12
A velocity of 26 miles by Dan	3.38	A velocity of 56 miles by Sad	15.68
A velocity of 27 miles by Dear	3.64	A velocity of 57 miles by Shun	16.24
A velocity of 28 miles by Dime	3.92	A velocity of 58 miles by Skin	16.82
A velocity of 29 miles by Drug	4.20	A velocity of 59 miles by Steam	17.40
A velocity of 30 miles by Duke	4.50	A velocity of 60 miles by War	18.00

The third figure will show the state of the weather by the same numbers used for this purpose in Form 1, and the two last figures will show the height of the exposed thermometer. The date will be shown by a letter at the end of this line corresponding by the number of its place in the alphabet to the date, thus: *a* for the first, *b* for the second, and so on; the 27th, 28th, 29th, 30th, and 31st will be shown by *a b*, *a c*, *a d*, *a e*, and *a f*, respectively.

31. In filling up Forms 1 and 5, when the reading of the thermometer is below zero, the word *minus* will be sent in the first of the two spaces assigned to the thermometer, and the whole number of degrees below zero in the other. In the marginal check-figures the minus sign may be used, but never in the body of the report. When the reading is one hundred degrees, or above, the first figure will be omitted in filling up these two forms, in order to keep the matter within two spaces. In translating, the figure can be readily supplied, as is done in the case of the first figure of the barometric reading.

Form 2 will be used by the operators in receiving the reports from other stations, and the spaces will be filled up in regular order, commencing at the upper left-hand space, and filling each space to the right in succession, on the first line, and then commencing at the left-hand space of the second line, and so on until each space is filled. Observers will require the receiving operators to sign and date each sheet, and also note the time of receipt, before receiving it from them. The sheets will be preserved, and at the end of each week will be made up into a neat package and mailed to the Chief Signal Officer, Washington, D. C., with a written memorandum showing the number of reports missed during the week, with names of stations.

32. Form 3 is the daily bulletin for public information, and will be filled out in manifold promptly, on the receipt of the morning and afternoon reports. It is divided into thirteen columns, filled as follows:

No. 1. Names of stations from which reports are received.

No. 2. Height of the barometer at each station, corrected for temperature, elevation, and instrumental error.

No. 3. Change in the barometer since the time of last report, using the plus sign before the figures when it has risen, and the minus sign when it has fallen.

No. 4. Height of exposed or open-air thermometer.

No. 5. Change of thermometer in the last twenty-four hours and *not* since last report. A rise or fall will be indicated by the plus or minus sign, as in the barometric column.

No. 6. Relative humidity will be entered in the *morning* bulletin only.

No. 7. Direction of the wind in the initial letters of the points of compass.

No. 8. Velocity of wind in miles per hour.

No. 9. Pressure per square foot in pounds.

No. 10. Character of wind.

A wind blowing from 1 mile to 2 miles per hour will be designated.....	Light.
From 3 miles to 5 miles	Gentle.
From 6 miles to 14 miles	Fresh.
From 15 miles to 29 miles	Brisk.
From 30 miles to 39 miles	High.
From 40 miles to 49 miles	Gale.
From 50 miles to 60 miles	Storm.
Absence of wind	Calm.

No. 11. Amount of cloud.

No. 12. Amount of rain-fall—in morning bulletin only.

No. 13. State of the weather.

33. Form 4 is a weekly report of all observations, and is filled up and transmitted weekly by mail to the Chief Signal Officer. It is divided horizontally into seven parts, in each of which will be entered the three observations of a single day under the proper headings. As two series of observations are taken at all stations, one for telegraphic transmission and one at different hours for transmission weekly by mail, two copies of this form will be used weekly, one for each series of observations, and both will be mailed in the same envelope.

34. Form 6 is a memorandum receipt for property, and will be filled up with the number and kind of articles received; signed, dated, and transmitted promptly to the property officer of the Signal Office in Washington, D. C.

35. Form 7 is the "press-report," and will be filled up in manifold properly, under the printed headings, as soon as practicable after the receipt of the morning reports, and copies furnished to the different afternoon papers. This form will also be used for the midnight report, and must be filled up rapidly at that hour, or as soon afterward as the reports are received, in order that it may be supplied to the different morning newspapers in time for publication.

36. Form 8 is the weather-map, to be made out in manifold, and to show the direction of the wind, kind of weather, height of barometer, height of thermometer, and velocity of wind at each station. The arrow is always to fly *with* the wind, and *not toward* the wind, like a vane. In printing these maps, great care must be exercised to make the figures and different signs correctly and distinctly. Observers must never allow imperfect or illegible maps to leave their offices. To insure accuracy, the printed maps must be carefully compared with the reports received before being issued; and if errors are found they will be corrected, if the correction can be made without disfiguring the map and without rendering it illegible. If they cannot be so corrected, the whole edition will be destroyed, as it is better not to issue any map than one which is imperfect.

BOOKS OF REFERENCE AND RECORD.

37. The following books of reference and record will be furnished by this office to each station:

For reference.—Guyot's Meteorological Tables, Buchan's Handy-book of Meteorology, Loonis's Treatise on Meteorology, Manual of Signals, Smithsonian Directions for Meteorological Observations.

For records.—Journal, Daily Records of Observations, Record of Bulletins, Record of Letters Sent, Record of Letters Received, Weather Map of the United States.

38. In the journal will be entered daily all matters of interest not provided for in the various forms, such as meteoric and auroral displays, earthquakes, and unusual atmospheric appearances and disturbances, giving in all cases, when possible, the time of beginning and duration of each. Especially will the observer enter a detailed account of the characteristic phenomena of every serious storm that passes over or near his station. In this book will also be noted the condition of the instruments, and when they are damaged in any way the cause will be stated. A monthly abstract of the entries in this journal will be forwarded to the Chief Signal Officer within five days after the expiration of each month.

39. The daily record of observations will be an exact copy of Form 4, and filled up in the same manner. Both series of observations can be entered in the same book, care being taken to date and time them properly.

40. The record of bulletins will be filled up regularly from the daily bulletins, of which it is a copy.

41. In the books of letters sent, and letters received, will be entered all letters sent and received relating to the official business of the station.

42. The map of the United States will be hung up in the principal room of the board of trade or chamber of commerce, or both, and the state of the weather throughout the United States will be shown upon it in the manner already described, as soon after the receipt of the morning report as is practicable.

GENERAL INSTRUCTIONS.

43. Each observer in charge of a station will, as soon as practicable after arriving at his station, make arrangements with some competent person to perform his duties in case of sick-

ness or disability, The person so selected must be carefully instructed in the use and care of the several instruments, in the manner of taking the observations, of making out and forwarding the weather-reports sent from the station, and the proper disposition of those received from other stations. His name and regular post-office address will be reported to this office as soon as this selection is made. The employment of this assistant will be temporary only, and he will be paid at the end of each month in which the services were rendered, at the rate of compensation fixed by the Chief Signal Officer, on forwarding the proper vouchers to this office, with a certificate from the observer-sergeant, stating the number of days employed, with the dates in each case.

44. In case of sickness or disability rendering an observer incapable of performing his duties, he will report the fact by telegraph to the Chief Signal Officer, and will forward by mail the certificate of his attending physician.

45. Observers will call for treatment in case of sickness upon the medical officers on duty at their respective stations.

46. At stations where there is no regular medical officer, a resident practitioner will be employed, whose account, made out in duplicate on the form given below, will be transmitted for payment to the Surgeon General of the Army, through the office of the Chief Signal Officer, Washington, D. C.:

THE UNITED STATES,

To _____, M. D., Dr.

For medical attendance furnished to _____, at _____, from _____ to _____, 187-, _____ visits:

\$ _____

I certify that the above account is correct and just, and that the charges do not exceed those customary at this place.

Subscribed and sworn before me this _____ day of _____, 187-. _____, M. D.

I certify that the above account is correct and just; that the services were rendered as stated; that I was on duty at _____, and could not secure attendance from a medical officer of the Army.

Observer-Sergeant, Signal Service, U. S. A.

Sworn to and subscribed before me this _____ day of _____, 187-. _____

Approved:

Chief Signal Officer, U. S. A.

47. The publication of the Government weather-reports by newspapers must be done without expense to the United States, as the information given is of general interest.

48. Observers will select such places for posting the daily weather-bulletins and maps as will insure their widest publicity at all hours of the day or night, and will report the names and locations of the places thus selected to the Chief Signal Officer. At the same time they will report the location of their own offices, giving the name of the street and number. This information will also be furnished to the manager of the telegraph office charged with the transmission and receipt of the reports.

49. Observers must not make use of the telegraph in communicating with the central office in Washington, except in cases of the utmost importance. Where the use of the telegraph is considered unnecessary by the Chief Signal Officer, the cost of the telegram will be charged against the observer sending it.

50. Communications to this office on official business will be written on the official size of letter-paper, inclosed in an official envelope, and directed to "The Chief Signal Officer of the Army, Washington, D. C." The words "Official Business" will be written on the right-hand upper corner of the envelope. Letters thus addressed and indorsed are free of postage.

51. Observer-sergeants will comply with the Regulations of the Army, and wear their uniform coat buttoned up while on duty. They are required to be especially neat and careful in their dress; and any negligence in this particular coming to the knowledge of the Chief Signal Officer will be considered sufficient cause for the reduction of the offender to the rank of a private soldier.

52. Each observer on station will forward weekly, by mail, to this office, a written illustration of the manner in which he makes the necessary barometrical corrections, and also of the manner in which he obtains the relative humidity of the air. A single observation weekly, properly and fully worked out, will be sufficient.

53. Observer-sergeants will not comprise in the same communication, matters relating to their meteorological observations and general details of duty, with those relating to property or money, in any form.

Letters of transmittal, application, or explanation, under these two general heads, must be written on separate sheets of paper, but may be sent in the same envelope, as a matter of economy.

54. Observers will give close attention to the observation and record of all local premonitory signs of storms or changes of weather, and report them promptly to this office. The following points should be particularly noted: direction and force of the wind; kind, direction, motion, and appearance of clouds; action of the barometer and thermometer before, during, and after a storm or change of weather, and such other purely local causes as appear to influence the results.

55. The attention of observer-sergeants is directed to the fact that they are required to make their reports absolutely correct, and that any shortcoming in this respect renders them liable to punishment. Aside from this, it should be kept constantly in mind that a single incorrect report may cause the loss of life and property to an unknown amount, and all reports must be made with this responsibility clearly in view. Whenever an observer is unable, from any cause, to get in his report, properly corrected, at the regular hours of report, he will *not* send the uncorrected portion, but will write the word "blank" in each of the spaces that would otherwise have been occupied by this portion of the report. Observers will *never* send any report or part of report which they have reason to believe is incorrect, and will bear in mind that it is safer and more in accordance with instructions to omit a report than to make a false one.

56. In the event of one or more instruments at a station becoming disabled and unfit for use, observers will fill up the space or spaces in the different forms intended for the readings of such instruments with the word "blank," until they are repaired or replaced. If the instruments cannot be properly repaired at the station, the observer will at once notify this office.

57. Observers are expected and required to improve themselves in the duties of their position, and are liable at any time after one year's service to be called before a board for their second regular examination.

58. Any carpenter, or other work found necessary in fitting up or repairing a station, the observer may forthwith have done, unless it involves considerable expense, when a detailed description of the work needed, with its cost, must first be transmitted to this office, and authority obtained before ordering it. The bills for the same will be sent to this office for settlement, always accompanied by a full description of the amount and kind of work performed.

59. One room, for the performance of his duties, will be rented by the month, at each station, by the sergeant in charge, but no more than eighteen dollars per month will be paid therefor without special authority from this office. He is also authorized to purchase, if necessary, the following office-furniture and supplies, viz: one desk, (price not to exceed \$20;) one table, with drawers, (stained pine, and not to exceed \$6;) two chairs, (not to exceed \$2 25 each;) one stove, with pipe, (not to exceed \$15;) one coal-scuttle, one fire-shovel, one water bucket, one cup or dipper, one goblet, one basin, one large lamp, one oil-can, one dust-pan and brush, one broom, two common spittoons, one lantern. The above-named articles must be of a cheap, plain, and substantial kind. Memorandum bills (unreceipted) for rent, labor, and purchases will be sent to this office as soon as presented, and will be settled at the earliest opportunity.

60. The necessary fuel will also be purchased at each station, until arrangements can be made to have it supplied by the Quartermaster's Department.

61. Observer-sergeants, in charge of stations, will be made responsible for the Government property issued to them or purchased by them, and they will be required to account for the same to this office, quarterly, on the prescribed forms. Property lost or damaged through the carelessness of the sergeants will be charged against them, and the value deducted from their pay.

62. The pay and allowances of the observer are to be obtained monthly from three different sources. His pay proper, \$20 per month, and his commutation of clothing, \$4 42 per month, (when no clothing in kind has been drawn,) may be procured by sending his descriptive list (about the 22d of each month) to the nearest Army paymaster, with a letter requesting payment. The paymaster will return vouchers to be signed by the sergeant, and when these are received back, the former will remit a check for the amount of pay.

Extra-duty pay is allowed by special authority from the War Department to the observer-sergeants, and together with commutation for fuel, \$3 per month, and quarters, \$10 per month, (allowed when sergeant is not serving with troops,) will be drawn from the Quartermaster's Department by the property and disbursing officer at this office. Each observer will make out his account, in duplicate, on Form 22, (blanks furnished from here,) in the following manner, placing the amount only in the receipt, and signing the latter. He will then transmit them to this office for settlement, not later than the 20th day of each month.

[Form 22.]

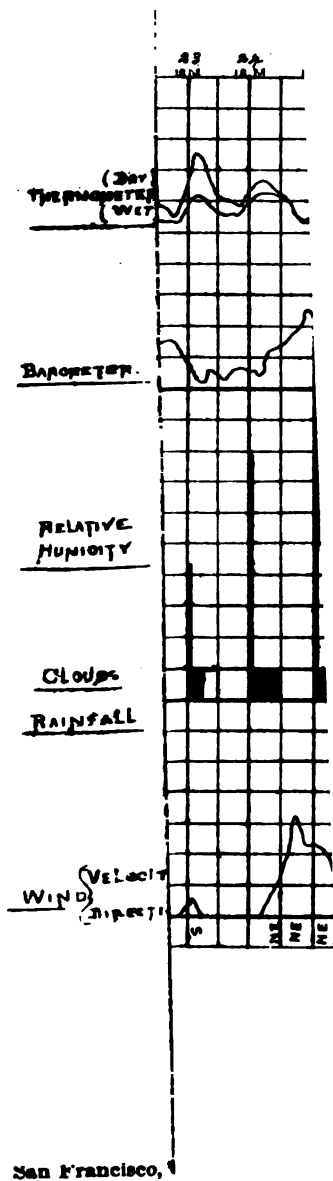
THE UNITED STATES,

To J. W. ROBINSON, observer-sergeant, Signal Service, U. S. A.,

Dr.

PAPER 6.

THE PRACTICAL USE OF METEOROLOGICAL REPORTS AND WEATHER.



[Form 22.]

THE UNITED STATES,

~~FRANK W. ROBINSON, Major Sergeant, Signal Service, U. S. A.,~~

Dr.

PAPER 6.

THE PRACTICAL USE OF METEOROLOGICAL REPORTS AND WEATHER-MAPS.

[Circular.]

WAR DEPARTMENT, OFFICE OF CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE,
Washington, D. C., ———, 1871.

The following paper is published by the direction of the Secretary of War:

It is the object of the publication to put it in the power of the largest number to make use of, and to profit by, the labors of this office; to enable them to test, and to avail themselves of some of the laws and generalizations by which meteorologists are guided; and to afford the means by which at once to supplement, judge of, and aid the work of the Department.

ALBERT J. MYER,

Brig. General and Chief Signal Officer, U. S. A.

THE PRACTICAL USE OF METEOROLOGICAL REPORTS AND WEATHER-MAPS.

In pursuance of the duty imposed upon the Secretary of War by the law providing for the announcement by telegraph and signal of the approach and force of storms, and under his direction, the office of the Chief Signal Officer of the Army, at the War Department, causes meteorological observations and reports to be made daily and nightly at 55 stations.

The office division of telegrams and reports for the benefit of commerce is organized for the preparation, receipt, and use of these reports.

At every station three observations are taken daily at the same moment of actual (not local) time for all stations, by the observer-sergeants of the signal service. The reports are immediately telegraphed to the office of the Chief Signal Officer at Washington.

By a carefully arranged system of telegraphic operation, copies of the full reports of all stations thus transmitted to Washington, or of portions of them, are sent at the same time to many of the signal-service stations in principal cities and towns.

At each station so receiving a tabular report, one or more bulletins are published. The observations are made synchronously at the different stations at the exact hours, 7.35 a. m., 4.35 p. m., and 11.35 p. m., Washington time.

The full reports from all stations are telegraphed to, and received at, Washington, translated from cipher and published in the form of bulletins of reports by the hours of 9 a. m., 6 p. m., and 1 a. m., respectively, (Washington time.) The bulletins of reports are designated as follows: That published at 9 a. m., the Morning Report; that published at 6 p. m., the Afternoon Report, and that published at 1 a. m., the Midnight Report. The bulletins, wherever published, at Washington, or elsewhere, exhibit the following particulars, viz: height of barometer; change since last report; thermometer; change in last twenty-four hours; relative humidity, in per cent.; direction of wind; velocity of wind, in miles, per hour; pressure of wind, in pounds, per square foot; force of wind; amount of cloud; rain-fall since last report, in inches and hundredths, and state of weather.

The following places, now occupied as stations of this division, were selected as of most immediate importance for meteorological purposes, and possessing telegraphic facilities. Those which are gradually to be added during this year are already designated by the Secretary of War, for similar reasons, with a design to perfect the net-work of the system so far as the appropriations allow.

- * Portland, Maine.
- * Boston, Massachusetts.
- * New London, Connecticut.
- * New York City, New York.
- * Philadelphia, Pennsylvania.
- * Baltimore, Maryland.
- * Washington, District of Columbia.
- * Wilmington, North Carolina.
- * Charleston, South Carolina.
- * Savannah, Georgia.
- * Augusta, Georgia.
- * Lake City, Florida.
- * Key West, Florida.
- * Mobile, Alabama.
- * New Orleans, Louisiana.
- * San Francisco, California.

- * Du Luth, Minnesota.
- * Pittsburgh, Pennsylvania.
- * Knoxville, Tennessee.
- * Indianapolis, Indiana.
- * Lynchburgh, Virginia.
- * Burlington, Vermont.
- * Keokuk, Iowa.
- * Grand Haven, Michigan.
- * Vicksburgh, Mississippi.
- * Escanaba, Michigan.
- * Marquette, Michigan.
- * Davenport, Iowa.
- * Leavenworth, Kansas.
- * Cairo, Illinois.
- * Cape May, New Jersey.
- * Galveston, Texas.

* Norfolk, Virginia.
 Mt. Washington, New Hampshire.
 Jacksonville, Florida.
 Oswego, New York.
 Rochester, New York.
 Buffalo, New York.
 Cleveland, Ohio.
 Toledo, Ohio.
 Detroit, Michigan.
 Chicago, Illinois.
 Milwaukee, Wisconsin.
 St. Paul, Minnesota.

* Montreal, Canada.
 Punta Rassa, Florida.
 * Memphis, Tennessee.
 * Nashville, Tennessee.
 * Cincinnati, Ohio.
 * St. Louis, Missouri.
 Omaha, Nebraska.
 Cheyenne, Wyoming Territory.
 Corinne, Utah.
 Shreveport, Louisiana.
 * Louisville, Kentucky.

At those places marked with a star, the number of reports received and published in the bulletin is sufficiently large to permit them to be used in the manner pointed out in this paper. The remaining stations, either on account of special reasons connected with their locality, or of those relating to the telegraphic system, are now chiefly used as reporting stations.

The morning and afternoon reports (bulletins) are posted at each of the local signal-service offices, and at a number of other public places in the cities and towns to which they are transmitted.

They are always open for examination. At the more prominent stations, and those in principal cities, large weather-maps are also posted every morning, exhibiting, by means of changeable symbols, the reports of the morning observations at the different stations. The midnight report (bulletin) is gratuitously furnished to every morning newspaper published in the city, at which a station of observation may be, which will insert it in its columns. The morning report is also delivered to afternoon papers in time for publication.

The observers at each station are instructed to afford every facility to the press and to the public for the earliest receipt and most extended use of the reports and information at their respective offices.

In addition to the bulletins, a statement of synopses and probabilities is prepared at the office of the Chief Signal Officer, and thence issued thrice daily. It is immediately furnished to the Associated Press, by which it is telegraphed to all its agencies throughout the country.

The synopses and probabilities, with which the public is familiar, through the columns of the different newspapers, are issued from the office of the Chief Signal Officer, at 1 a. m., 10 a. m., and 7 p. m., daily.

In the study of local probabilities, the student should make sure that he has before him (as in the columns of the local newspaper) the latest synopses and probabilities issued at Washington. To be sure of such facts he must notice the hours at which they are dated from the office in Washington. *The midnight reports dated at 1 a. m. of each day ought to be found in the morning newspapers of that day; the morning report dated at 10.30 a. m., of each day, is furnished in time for the afternoon and evening papers.*

At places where stations are established, the use of the bulletined reports in the mode suggested in this paper would often, perhaps, enable the student to make forecasts of the weather with greater local particularity than can be expressed in the "synopses and probabilities" telegraphed to the press, as the latter must, in a limited number of words, give generalizations embracing the whole country. And it is believed that, in many places distant from any station, but on or near the lines of railways or steamers, or with other modes of rapid communication, the bulletins can be utilized in a corresponding manner. *If, at the station nearest to persons interested, as, for instance, the board of trade, or chamber of commerce, or the meteorological committee of an agricultural society, or individuals interesting themselves in the study of practical meteorology, no newspaper prints the bulletins furnished gratuitously by this office for that purpose, there is a strong probability that, upon proper application made to the editors or proprietors, they would be printed as of interest to the subscribers and readers.* In cases where delay would thereby be avoided, arrangements can often be made with the publisher to have copies of the newspaper containing bulletins sent in advance of its delivery by mail. By such means, and others which will suggest themselves, a record of meteorological conditions elsewhere can be obtained in many places within so few hours after the observations are taken at the different stations, as to enable a student to make for himself many important deductions. The accuracy of these would be greatly assisted by local observations made at the same time as those of the observers of this division, with similar instruments, and by frequent local observations made during any time at which there is especial interest or anxiety as to the probable weather.

The navigator, the agriculturist, or the student, can supplement in this way, by the readings of his own instruments and his local knowledge, the reports and information furnished by the United States, and is fitted to arrive at intelligent conclusions as to the data before him.

There is yet no provision for furnishing instruments, on the part of the United States, to any other than the observer-sergeants, although it is possible that some such authority may hereafter be given. Full information as to the instruments and their use will, however, be furnished to all persons who may provide them for themselves.

In addition to the weather bulletins, and the "synopses and probabilities," a graphic weather chart or map is issued thrice daily from the office of the Chief Signal Officer of the Army, at the War Department. To those who know how to use them, all of these reports offer valuable help in estimating the probable character of the weather at any station or over any district during the following day, and often for a still longer period. The bulletins and graphic charts, properly filled, convey the same information, with this difference, while the former merely tabulates the reports alphabetically, the latter reveals to a single glance of the eye a synoptic view, at once, of the meteoric conditions at the different stations, and of the deductions thence to be made as to the conditions of the atmosphere then extending over the continent.

The graphic charts are of additional value, from the fact that it is often possible to trace upon them, in lines, the progress of storms, or the change of meteoric condition, (as the movement of an area, of high or low barometer,) from report to report, and thus by considering the past, and by applying laws and generalizations reasonably well established, to estimate more easily the "probability" of the future.

Those who receive the bulletin through the newspapers, or otherwise, can, if they desire, so easily transfer its information to the blank charts, that the reader is supposed to be in possession of, or familiar with, a series of such weather-maps.

As the anticipation of dangerous winds is at present the most important subject for examination, the following remarks are made with the view of directing the attention to those matters that are considered to have a direct bearing upon the subject of storms and gales in the United States. The study of the science of meteorology and of the theories that have been formed to explain the complicated phenomena that are daily presented in our atmosphere will be but lightly touched upon, since persons of education are already in possession of sufficient inductive generalizations to give a fair insight into the actual nature of the changes that are taking place at every hour of the day *

ABBREVIATIONS USED IN THE PRESS-REPORTS.

It may be well to state here that, in the weather synopses and probabilities emanating from the Signal Office, different parts of the country are thus designated:

Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island are alluded to as the *New England States*, or the *Northeast*, or simply as the *Eastern States*.

New York, New Jersey, Pennsylvania, Maryland, District of Columbia, and Virginia, as the *Middle States*, or sometimes as the *Middle Atlantic States*.

North Carolina, South Carolina, Georgia, and Northern and Eastern Florida, as the *South Atlantic States*.

Western Florida, Alabama, Mississippi, Louisiana, and Texas, as the *Gulf States*.

Sometimes the Gulf States, the South Atlantic, Virginia, Tennessee, Kentucky, and Arkansas are grouped together as the *Southern States*.

The *Lower Lakes*, when used, means Lakes Erie and Ontario.

The *Upper Lakes* are Lake Superior, Huron, and Michigan.

The *Northeast*, popularly, means the country lying between the Mississippi and the Missouri Rivers.

The *Southwest* means Texas, Indian Territory, and New Mexico.

Pacific Coast, or *Pacific States*, includes California, Oregon, and Washington Territory.

The *Ohio Valley* includes the belt of country about two hundred miles broad from Pittsburgh to Cairo.

The *Mississippi Valley* includes a belt of about the same width, from Vicksburgh to Davenport.

The extensions from Missouri to Ohio, &c., refer to areas reaching to and including the central portions of the States named. Thus, a report "Westerly winds extending from Iowa to Pennsylvania," would convey that those winds would be felt in the interior of those States as well as over the territory lying between them of the respective States.

In the *coasts*, &c., is included the land between the coasts and the parallel range of coast hills or mountains. In Texas, Louisiana, and Northern Florida, a belt of land extending a hundred miles inward would be included.

Winds are said to blow from northeast when they are generally included within the quadrant from north to east, &c., and similarly for other directions.

THE GRAPHIC WEATHER-MAP.

A weather-map should be made out as often as a bulletin is received; and it is a very great advantage to be able to do this thrice daily; one map every day is the least that can be usefully studied. It is found best to preserve the maps in books of a hundred or so, they being very exactly superposed upon each other.

Owing to the translucency of the paper on which they are printed, it is generally possible

* Blank charts on which to enter observations can be obtained from the office of the Chief Signal Officer, at Washington, D. C., at actual cost, (\$2 75 per hundred,) and will be sent by mail, free of other expense, to applicants.

to see through several of the sheets, and thus more easily compare the successive phases of the weather.

The record for each station should be entered in its appropriate place; the wind and weather may be easily indicated by arrows and black or white circles.

All the entries being made with a black-lead pencil, the whole operation will barely consume fifteen minutes.

Auxiliary charts of the same size should be at hand, on which are entered the isobaro-metric* and isothermal lines for the month, and such other data as need to be continually borne in mind.

Especially important is it that the eye should be familiar with the ordinary charts of physical geography, on which are pictorially given the belts of trade-winds and the anti-trade winds, the mountainous and alluvial regions, the plateaus, &c., and it should be borne in mind that the climatic belt continually moves up and down on the earth's surface with the sun's apparent annual motion. Relief-maps, or orographic charts, showing, pictorially, the face of the country whose meteorology is studied, will add the liveliest interest and clearness to the investigation.

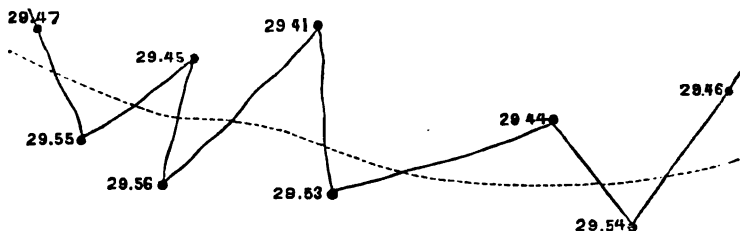
It is probable that elementary charts, showing the principal topographical and meteorological features of North America, and on precisely the same scale as the weather-map, will be eventually published by the office of the Chief Signal Officer; but for the present the desired information may be obtained from such works as Keith Johnston's Physical Atlas, Guyot's, Cornell's, or Maury's Physical Atlas and Geography, Buchan's Meteorology and his essay on the Distribution of Atmospheric Pressure; Blodgett's Climatology of the United States, Coffin's Winds of the Northern Hemisphere.

The manner of tracing isobarometric lines on *weather-map* is this:

1. Record with a lead-pencil in small plain figures at each station the height of barometer as given in the report.

2. Find the location of *lowest* barometer—say 29.45. Draw a line with red pencil through those stations where the barometer stands between 29.45 and 29.55; mark this line at each end, or in two or three places, 29.50. Then take the height at 29.55 to 29.65; trace a line in the same way as before, marking it 29.60; continue this until the highest barometer is reached.

By tracing the line of the map of the previous observation, showing through the translucent current one with *blue*, (or dotted red over,) the difference in location of the area of lowest pressure, and the changes since last report, also the direction in which the storm (if there be one) is moving, and the rate at which it is progressing, are readily shown. The following is an illustration: The dotted line showing the isobaric line of 29.50, located by the readings supposed to have been found upon the map on either side of that line.



The specimen of a War Department weather-map accompanying this paper will enable this subject to be fully understood.

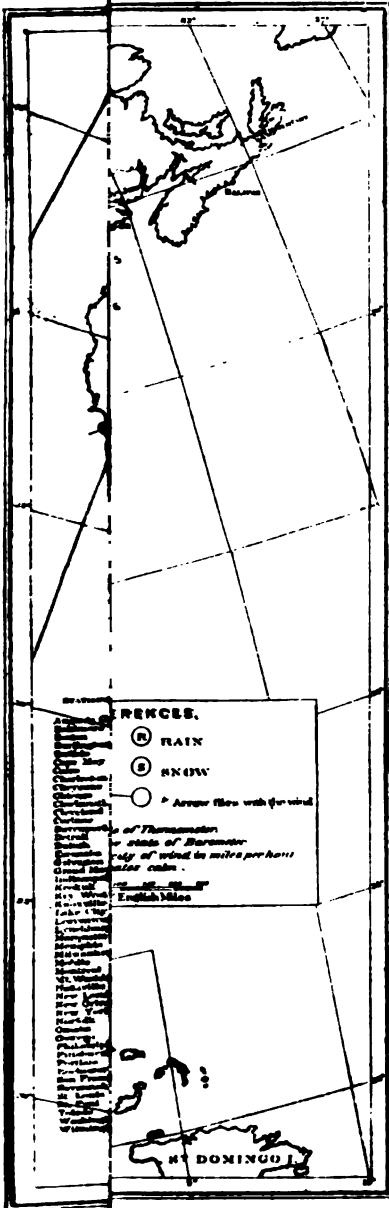
THE ATMOSPHERIC PRESSURE.

The pressure of the atmosphere at a given place is not expressed by the weight of the mercury sustained in the tube of the barometer by that pressure, but by the perpendicular height of the mercurial column.

In comparing barometric observations at different stations, it is necessary to take into account their respective elevations above the sea-level; for, as there is an ascent above the sea, the heavier strata of the atmosphere are left behind, and the pressure being thereby reduced, the height of the mercury is proportionally reduced.

A slight acquaintance with the weather-map will, however, bring to notice the fact that the barometric heights, as reported from Mount Washington, Cheyenne, and other very elevated stations, even after all allowances are made for the altitudes, are very different from those at neighboring stations which are more nearly on the sea-level. Attention is therefore, for the present, confined to the barometric readings at those stations that are less than 2,000 feet above the sea, which includes nearly all those from which reports are at present received.

* Isobarometric (sometimes abbreviated to isobaric lines, (or isobars,) means lines along which the mercurial column indicates equal pressure.



A few trials will convince one that it is almost always possible to draw a continuous line through those points where the barometer stands at 30.00 inches. If, furthermore, from two neighboring points there are reported, respectively, 29.95 and 30.05, then half way between them, it may, in the majority of cases, be assumed that the barometer stands at 30.00. By connecting with red lead pencil lines all the points thus determined; that narrow band over which the barometric pressure is uniform is made visible at a glance.

It is generally well understood that the height of the mercury in the barometer-tube is a simple and direct measure of the intensity with which the atmosphere is at that moment pressing down upon the basin of the barometer, and upon the neighboring region of the earth; and not only is the pressure downward, but equally so is it exerted upward and horizontally in all directions.

The pressure varies in intensity at any station with the varying temperature, moisture, depth, and motion of the atmosphere. There is also a slight regular rise culminating between 9 and 10 a. m., and a fall culminating between 3 and 5 p. m., called the diurnal change.

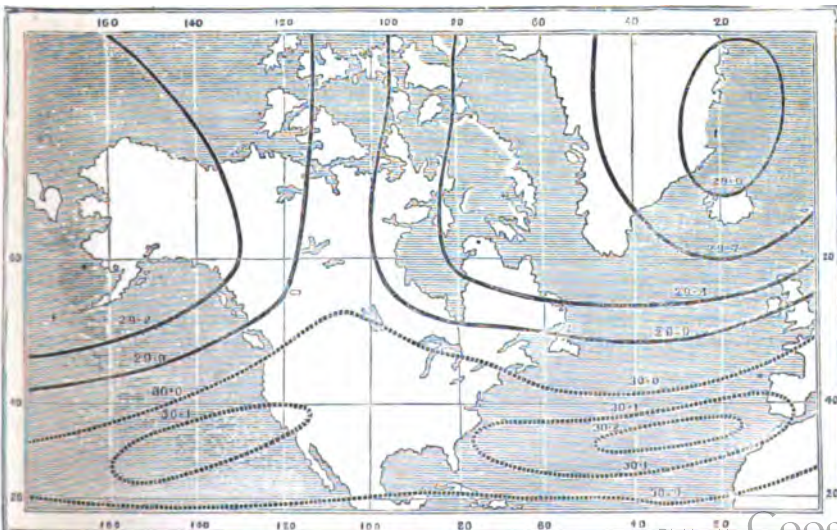
The average height of the barometer at the level of the sea, on the Atlantic coast of the United States, does not vary much from 30.00; on the western plains it rises to 30.2 in the winter. It diminishes as we approach the Arctic regions.

Now draw other red lines showing where the pressure is lower than its average value, (30.00), or where the barometer stands at 29.90, 29.80, &c., inches. These lines will almost invariably be found to be upon one and the same side of the line of 30.00, and to be approximately parallel to each other. Oftentimes they gradually inclose with their bounds a central area of small extent, and over which the pressure is decidedly lower than anywhere else on the map. If this central area be not too near the limiting line of the signal-stations, it will be found to be completely inclosed by the encircling lines of equal pressure, or isobarometric lines, as they are called, words which, for convenience, are now generally contracted into the simple noun *isobars* or *isobars*.

Similarly, if, on passing the other side of the line of 30.00 inches of pressure, a system of isobars connecting the points where the barometer stands at 30.10, 30.20, &c., be drawn, there will be noticed an area of the highest pressure, though very frequently the stations are not widely enough extended to give the precise limits of this area. In general the areas of average and high pressure are more extensive than those of low pressure.

Could reports be received from the whole of the north temperate regions of the earth, from the oceans as well as the continents, it would undoubtedly be found that each area of lowest pressure is completely separated, by areas of average and high pressure, from its neighboring low-pressure areas. For the limited region from which the daily reports are received this is found to be approximately true; so that, for instance, a low barometer over the extreme western plains will be bounded by areas of high barometer on the Pacific coast and the Mississippi Valley, while another area of low pressure prevails in the New England States. On the borders of the great areas of high barometer, and within the areas of low barometer, occur the smaller areas of low pressure with which cyclones, tornadoes, and thunder-storms are associated. It is the study of these areas, of high and low barometer, that is now of particular interest.

ISOBAROMETRIC LINES, SHOWING, IN INCHES, MEAN ANNUAL ATMOSPHERIC PRESSURE FOR UNITED STATES.



The dimensions of these smaller areas vary from that of a few square miles, as in tornadoes, to that of five hundred miles square, as in extensive cyclones. The largest areas of high barometer of interest to this country are those of the Tropic of Cancer and the South Atlantic and Pacific Oceans, and (in the winter) that which exists in the interior of the North American Continent.

While carefully studying the every-day variations of the barometer, the meteorologist will not forget each day diligently to compare the day's isobars with the mean monthly isobars on his isobarometric chart.

THE WINDS AND THEIR LAW.

Whether considered as the indices, or as the causes of coming changes of weather, no phenomenon is more important than that of the winds. Upon the direction and force of the winds, some meteorologists lay very great stress in every attempt at storm forecasting; and, in order to determine these, it is necessary to draw the isobars on the weather-chart.

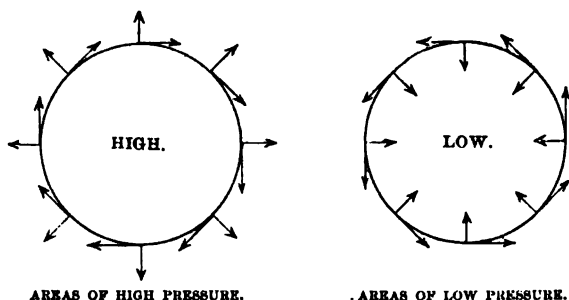
Assuming the lines of equal barometric pressure to be drawn on the weather-chart, it is at once perceived that, in well-understood accordance with the laws of mechanics, the atmosphere must be pushing from the regions of higher to those of lower pressure. The resulting movement of the air, modified by the forces of inertia and friction, and by the rotation of the earth and local obstructions, is converted into the *local* winds, whose directions are indicated by the arrows upon the maps, and whose velocities are given in miles per hour. These winds may be called local winds, as distinguished from the general winds in any section, and from the great currents of air to be hereafter spoken of. The general winds appear to be primarily dependent upon the existence and position of the areas of low and high pressure. The great currents, spreading, as they do, over whole continents and encircling the earth, are largely influenced by, if not dependent upon, the earth's axial rotation.

If the earth were not in rotation on its axis, the winds would uniformly blow in straight lines outward from the center of every area of high barometer toward the surrounding localities of lower barometer, just as naturally as the water-wave tends to spread itself out in radial lines.

Observation, however, has long since clearly shown that, in this hemisphere, within any area of high pressure, the winds will be found to be not only blowing away from the center, (outwards,) but also to be deflected towards the right hand as they move forward. Observation has also shown, with equal clearness, that, in this hemisphere, within any area of low pressure, the winds will blow toward the center (inwards,) and will also be deflected toward the right hand as they move forward. This deflection to the right has been demonstrated by Mr. William Ferrel, of Cambridge, Massachusetts, to be a mathematical necessity arising from the influence of the earth's diurnal rotation, which causes everything moving on its surface to deflect slightly to the right in the northern hemisphere, and to the left in the southern hemisphere. This force, by which, to give a popular illustration, a railroad train is made to bear more heavily on the right-hand rail of the track along which it advances, is the key to the explanation of any phenomena in connection with atmospheric and other currents. This interference drawn from it, taken in connection with concurrent observations, enables one to construct the following table, which shows which winds will generally prevail on each side of areas of high and low pressure:

The observer being—	THE PREVAILING WINDS WILL BE—	
	Low pressure.	High pressure.
On the N. side.....	N. and E.....	S. and W.
On the N. W. side.....	N. W. and N. E.....	S. E. and S. W.
On the W. side.....	W. and N.....	E. and S.
On the S. W. side.....	S. W. and N. W.....	N. E. and S. E.
On the S. side.....	S. and W.....	N. and E.
On the S. E. side.....	S. E. and S. W.....	N. W. and N. E.
On the E. side.....	E. and S.....	W. and N.
On the N. E. side.....	N. E. and S. E.....	S. W. and N. W.

The same regular distribution of the winds is shown by the arrows in the accompanying diagrams :



The deflection from the radial line (i. e., *to the right*) is not always nor usually 90° , as represented in the diagrams, but the angle is generally between 30° and 60° , amounting to 60° or 80° only in case of severe storms, cyclones, &c. In using the above table or diagrams, if, for illustration, it be assumed that the observer is placed within an area of unusually low pressure, then, on the northwest side of its center he should find the wind blowing from some point in the horizon between northwest and northeast. If he is within an area of high pressure, and on the northwest side of its center, he should find the wind blowing from some point in the quadrant between southeast and southwest.

When no well-marked central areas are actually within the limits of the map, the winds still unite with the lines of equal pressure in indicating such areas as existing near by. Thus, during the summer, for instance, the southwest and the southeast winds of the western plains indicate the low pressure that exists at that season in the Missouri Valley and northward. When the pressure over a considerable area is very uniform, then minor local influences (such as cannot generally be exactly located by the limited number of reports that are at present received) affect the gentle winds that then exist. On such occasions local differences of temperature and moisture, affecting, as they do, the local pressures, give rise to light winds extending over only a few square miles, but which still tend to obey the general laws given in the above table.

Vertical, as well as horizontal systems of winds, depending upon the disturbances of equilibrium continually taking place in the region of the clouds, always exist in connection with the ordinary horizontal gales. These are, in fact, a most prominent feature of tornadoes and water-spouts.

The system of winds above given is not only that which all observations show to exist, but also that which follows from the mathematical theory of the motions of fluids on the earth's surface, as developed by Ferrel and others, which, as has been already stated, proves that all bodies, whatever be their direction of motion on the earth's surface, in the Northern hemisphere are deflected, or trend towards the right hand in their onward progress. This deflection towards the right, small as it is originally, increases with the diameter of the storm, and seems by its cumulative force to determine the general direction of the rotation of the West India cyclones, as well as that of the much weaker storms that pass over our continent; in all which it is evident that the air actually has a sinuous spiral motion inward toward the central area of lowest pressure, and at the center upward from the earth's surface, on the outer edge of the tornado and cyclones a downward current is evident. This same principle (Ferrel's law) also decides the deflection northward of the afternoon sea breezes and southward of the evening land breezes, as experienced along our Atlantic coast from North Carolina to Florida, which deflection is, however, greatly increased by the general trend of the coast, and the greater friction of air passing over land than over water.

The rule called "Buys Ballot's Law," is not to be confounded with that which, for brevity, is called "Ferrel's Law." The former is expressed as follows:

"If any morning there be a difference between the barometrical readings at any two stations, a wind will blow on that day in the neighborhood of the line joining those stations, which will be inclined to that line at an angle of 90° or thereabouts, and will have the station where the reading is lowest on its left hand side."

This rule is a generalization first specially announced for Holland and the neighboring country, and has been found applicable to the weather in Great Britain in cases where strong winds occur.

The law was first published by Buys Ballot in 1860;* it had also been deduced by Dr. Lloyd in 1854, and had been recognized under a different form by the students of tropical cyclones and hurricanes.

* *Eenige Regelen voor aanstaande Weersveranderingen in Nederland, voornamelijk id Verband met de dagelijksche telegraphische Seilen. Utrecht, 1860.*

This rule will evidently hold good in general, best when the two stations considered are in a line with the centre of the neighboring area of high or low pressure. It is, if possible, always best to seek the boundaries of these areas by means of the isobaric lines, and having located these, to make use of the laws of mechanics that are applicable to the whole earth's surface. Buys Ballot's rule was originally intended to be applied to regions from which but few isolated reports were received.

Since, however, the centers of disturbance are in continual motion, it is evident that "we must not interpret the rule too strictly." In investigations upon the applicability of this rule to the British weather-reports, an allowance of about one hundred miles was made for the movement of the center of disturbance, and thus it was deduced that "94 per cent. of the gradients recorded were succeeded by winds in the direction indicated by the law," and in 62 per cent. both the force and direction were correctly indicated.*

The force of a local wind at any point, and at any moment, certainly depends primarily upon the relative barometric pressure at points in the vicinity, and upon the rapidity with which the pressure has been or at that moment is changing; but the force and direction of the wind at any station are also very materially influenced by the character of the ground in the immediate and distant neighborhood. The wind which on the ocean would blow with a certain velocity will have but one-half or one-third of that velocity when blowing over hilly country. This is due to the lesser friction on the ocean, and this frictional resistance in two different ways disturbs the direction of the wind:

1. If, for example, there is a north wind blowing, very generally over a lake of elliptical shape, such as Lake Michigan, and over the neighboring country, then on the central line of the lake a strong north wind will be experienced, and a feeble one at the points on land far removed from the shore; but at points on the northwest and southeast shores of the lake a northwest wind will be experienced, while a northeast wind will be observed on the northeast and southwest shores. Similarly, if a south wind blows steadily over the Southern States and coast, it will, to observers on the coast, appear as a southwest wind, and a north wind will be changed into a northeast wind, and this, too, independently of the additional influence exerted by the earth's rotation, which should, in this present example, increase the extent of those changes, in accordance with the law above given, as first deduced in all its generality by Ferrel.

2. The friction of the earth's surface has a greater influence upon strong than upon feeble winds, and thus does more to retard the tangential than the centripetal motion of the air in the neighborhood of an area of low pressure. Consequently, in severe storms on land, the wind is found to be directed more nearly toward the central area of the disturbance than in oceanic storms. Thus in tornadoes the inward and upward motions predominate over the tangential.

Precisely as the velocity over water is greater than over land, so is the velocity far above the earth's surface greater than lower down. Balloon voyages show occasional velocities of one hundred miles per hour. The severest gales on the earth's surface rarely exceed eighty-five miles, though doubtless this has been exceeded in certain tornadoes and momentary gusts, &c. The currents only a few hundred feet above the earth have frequently twice the velocity of those observed on the surface, as shown by observations of the velocity of passing cloud shadows.

The friction of air moving over land or water gives rise to ascending currents, extending over large areas of land, and of which the westerly winds of the Pacific Coast and the easterly winds of the Atlantic Coast are important examples.

Heavy gales (*i. e.*, those having velocities of forty miles and upward) immediately attend the areas within which the isobars are very near to each other, and die away so soon as these lines are seen to separate. In the case of violent but *very* local storms, the stations will generally fail to give more than a general indication of the disturbance.

The existence of several local winds a short distance above the earth's surface, and on the tops of mountains, and in the regions traversed by balloons, and especially over the edges of lakes, the ocean, and arid, dry plains, is very frequently observed, when, at the same time, neither the barometer nor the wind is affected at the lower stations near by.

This phenomenon is probably in most cases due to the fact that very rapid barometric changes may exist above us, while below there is perfect equilibrium.

Thus, suppose that at two neighboring stations the barometers read the same, and the winds are light or calm, but the temperatures are, respectively, ninety and seventy five degrees, and these differences occur in summer time at points less than a hundred miles apart. It follows that, at an elevation of a mile above these points, the barometric pressure may be at least a tenth of an inch different, and this would suffice to set a strong wind in motion.

By considering the influence of moisture in diminishing the density of the air in which it is present, it is shown that the decided differences of pressure that exist at neighboring stations may easily be completely reversed in the strata from one to two miles above the earth.

The destructive power of a wind, or its power to overthrow or move any body, is the dif-

* See R. H. Scott, *An Inquiry into the Connection between Strong Winds and Barometrical Differences*. London, 1869.

ference in the pressure on opposite sides of a body. In steady winds this difference depends not only upon the velocity of the wind, but equally on the shape of the resisting body. Those bodies offer least resistance in which (as in fishes, the hulls of ships, bridge-piers, &c.) the hinder portion receives the backward pressure of the fluid that presses up against it, thus permitting as little approach to a vacuum as possible. In the case of sudden gusts, the resisting body receives the whole force of the impulse precisely as a blow. The atmosphere, though so light, is not devoid of mass and inertia. Air in motion at the rate of one hundred miles per hour strikes obstacles with a force equal to that which moves the same volume of water, would exert if moving at the rate of $3\frac{1}{2}$ miles per hour.

In descending from higher to lower land, the wind's velocity is affected by the force of gravitation in a measure quite independent of the differences of pressure shown by the horizontal isobaric lines. Although the primary effect of gravitation is in the vertical direction, yet a portion of this is transferred to the horizontal, and the descending currents acquire increased velocity. Such descending winds are found not only in mountainous countries, but also on the western plains.

Winds of this class are sometimes to be considered as the pushing effect of a heavy descending gas; while ordinary winds are considered as the effects of the drawing action of areas of low pressure. Both cases, however, more properly should be regarded as simple cases of the transfer of air, in the continual struggle going on to maintain that equilibrium of pressure, for which the atmosphere is ceaselessly struggling, but which it is not possible for it to realize except for brief intervals of time.

THE TEMPERATURE.

The thermometric conditions of all parts of the earth's surface are mainly dependent upon the apparent annual and daily motions of the sun.

As fluids and gases are both bad conductors of heat, the distribution of heat in the atmosphere is effected most largely by the winds or by convection, just as in the ocean it is effected by means of the grand aqueous currents.

Although the average temperature is higher at the southern stations than at the northern ones, and higher in the day than at night time, yet the weather-map will disclose innumerable departures from this law, and especially so if any great differences in the pressure, or any extended cloudiness exist.

Aqueous vapor visibly suspended in the air as haze or cloud, serves as an effectual and double shield against the radiation of heat from the earth, and also against the sun's rays themselves. Even the invisible particles of vapor floating in the atmosphere, however rare, present an obstruction to the free passage of heat of low intensity much in the same way as haze and smoke obstruct the light, or as stones in the bed of a water-course retard the flow of that fluid. On the most Alpine situations, where, on account of their loftiness, much less aqueous vapor is interposed between them and the cold stellar regions, radiation is least disputed, and, consequently, when exposed to the direct rays of a serene mid-day sun the heat is intolerable, while at night the unimpeded radiation produces a corresponding extreme of cold. The temperature observed is the difference between the heat given out and that received in a definite interval of time.

The temperature of the lower air depends primarily, indeed, upon the amount of heat poured down upon the earth by the sun, and the amount absorbed by the air, as the earth radiates its heat back into space; but, in addition to this, the heat held latent in the vapor diffused through the air is at times liberated by the condensation of the vapor into fog, rain, and snow, and then it becomes sensible to the thermometer. During the day a moist atmosphere will become warmer than one that is dry, and during the night the radiation of heat through a moist atmosphere will be less than that through a dry one. During cloudy or hazy weather the radiation is almost wholly cut off, so that a very uniform temperature prevails between the earth and the bottom of a layer of clouds. On the other hand, sufficient heat is absorbed (i. e., becomes latent) in the process of evaporation to materially reduce the temperature of the air; thus it is that "drying winds" are also "cooling." An increase of barometric pressure, by increasing the capacity of the air for moisture, serves to stimulate evaporation, and temporarily reduce the temperature. A diminution of pressure, and consequent expansion of confined air, produces a lower temperature and diminished capacity for moisture, until the condensing vapor gives out its latent heat.

Again, the lower strata of air receive heat from the upper strata, and radiate back to them, so that the temperature on the earth's surface is in part the result of this interchange. In the normal condition of a clear sky, the temperature above should be less than that prevailing below. The abnormal condition is generally the consequence of the elevation of moist air into the regions high above the earth, and the condensation of its moisture consequent upon the expansion of the air. The undue heat thus generated in the upper strata is radiated down to the earth as well as out into space.

Examination of the weather-charts will show that the temperature varies much less over cloudy than over clear districts; that it varies less in low than in elevated regions; that it is warmer on one side of an area of low or high pressure than the other, and generally warmer in advance of any storm center and colder in the rear.

The meteorologist, in search of the confines of the storm-area, and the path of its advance will carefully compare the reported temperatures of contiguous stations, (lying in this path,) both with each other and with the isothermal lines for the season.

By careful attention to the position of the areas of rising and falling temperature, he receives an early intimation of approaching storms, as will be mentioned in a subsequent section.

The relation of the temperature (even for vast regions of country) to the barometric pressure at distant points, is full of importance and instruction. For instance, severe frosts and cold have frequently been experienced in Great Britain and Western Europe, traceable directly to an abnormally high pressure of the atmosphere over Iceland, precipitating a powerful polar current of air toward the southeast continuously for periods of two or three weeks.

It is probable that, at some future time, weather-telegrams from the West Indian and Sandwich Islands, the North Pacific Ocean, and Alaska, by furnishing barometric readings, may give indications of the weather in the United States.

THE MOISTURE, (RELATIVE HUMIDITY.)

In all localities on the globe, and at all times, moisture, in greater or smaller quantities, exists in the atmosphere, which is, consequently, never absolutely dry. Intervals or interstices occur between the particles of the dry air, which are partially filled with this ever-present aqueous vapor. The more numerous such intervals are, the greater is the *capacity* of the air for moisture; and when these intervals are so full of vapor that the air is incapable of containing or holding any more, it is said to be *saturated*.

An increase of heat increases the capacity of the air for moisture; while, on the contrary, a fall of temperature is the occasion of a corresponding diminution of the capacity for vaporous matter.

The important element of moisture is given in the Signal Service bulletins, not in the absolute quantity in which it is found at any given place, but as a percentage of full saturation, or what, in the language of meteorologists, is expressed by the term *relative humidity*. This must not be confounded with absolute humidity, which is a very different thing. For, supposing the temperature of the air at a given place to be 40°, and fully saturated with aqueous vapor, and then to be suddenly raised to 50°, without any addition being made to its store of vapor, its absolute humidity would in each case be exactly the same; but in the former case the weather would, in popular language, be very damp, and in the latter case very dry. In the former case the relative humidity (or *humidity*, as it is often simply called) would be very high; in the latter, very low.

Watery vapor dissolves in air very much as salt dissolves in water; and as the salt is deposited in crystals whenever the water becomes fully saturated, so, whenever the air becomes fully saturated with vapor, the latter is deposited on the earth in the form of mist, dew, and rain, if the temperature be high, or as frost, hail, or snow crystals, if the temperature be low.

One cubic foot of air, having a temperature of 50°, and under a uniform barometric pressure of 30.00 inches, and *fully saturated*, will hold 4.28 grains of water, according to Glashier's tables. If, under these conditions, the temperature or the pressure of the air is lowered, there will result a deposition of a portion of the water, and that either in the form of fog, dew, rain, frost, or snow and hail. On the other hand, if there is an increase in the temperature or the pressure, the air becomes capable of holding a larger quantity of vapor, and ceases to be fully saturated. Relative humidity expresses the proportion of vapor actually contained in the air compared with what the air could contain.

By denoting full saturation by 100 per cent., and absolute dryness by zero, the relative moisture of the air at the different stations can be indicated on the map by the proper percentage. [This relative humidity is obtained from the Tables of Relative Humidity, (pp. 59, 60,) where the practical process is fully explained.] This table is directly applicable to such stations as are less than 1,000 feet above the sea. A correction of considerable amount is needed for mountain stations.

The absolute quantity of moisture in the normal condition of the atmosphere decreases with ascent above the earth's surface, but the law of decrease in cloudy and falling weather is, of course, different from that in clear weather. The degree of saturation of the atmosphere increases up to the lower-cloud stratum, and rapidly decreases above the top of the highest clouds. Indeed there is reason to believe that very little moisture enters the higher strata of air, except as it is carried up by the ascending currents; and that rain-falls are mostly derived from low clouds that have derived their moisture from the earth near by.

Fog and dew attend the supersaturation of the lower strata of air. Rain and snow are merely the moisture deposited from supersaturated strata above. The weather-chart will show an increase of moisture near bodies of warm water, fields of snow, extensive forests and meadows, &c., as compared with dry plains and rocky mountains. The humidity will be found large in advance of storm-centers, and small in their rear. It will be greater over warm, cloudy districts, than where cold and clear weather prevails.

Certain winds will be found to be moister than others. The west and northwest are

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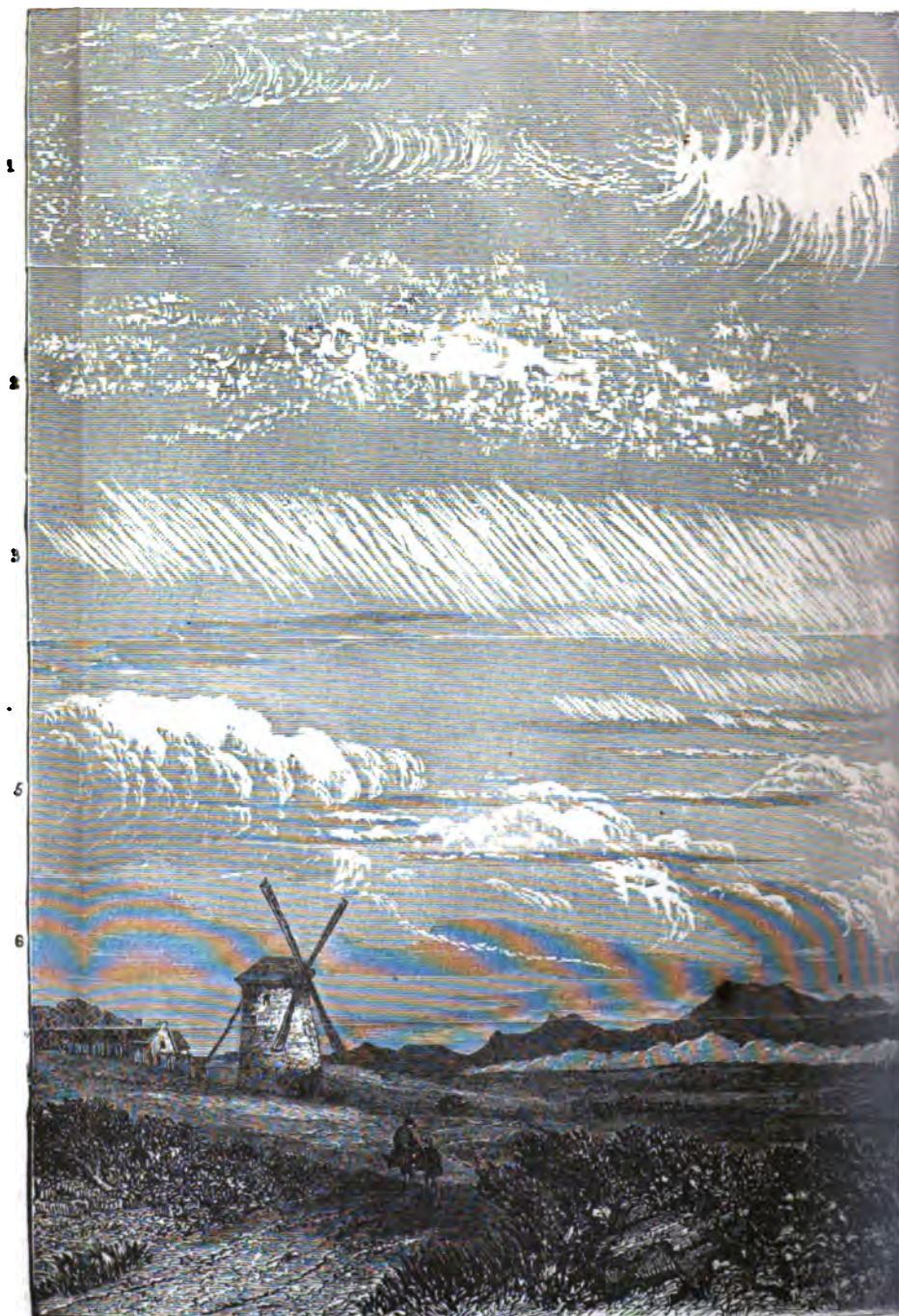
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1. Cirrus. 3. Cirro-stratus. 5. Cumulus. 7. Stratus.
 2. Cirro-cumulus. 4. Cumulo-stratus. 6. Nimbus.

generally the driest in the Mississippi Valley. Dry air almost always predominates on the leeward side of mountain-chains, and is the characteristic of the plains and plateaus west of the Mississippi Valley. Dryness will be found attending clearing-up weather. Dampness, or a large increase of relative humidity, accompanies threatening weather as an almost invariable premonition. Ascending currents of air also increase in dampness; descending currents grow drier.

THE CLOUDS AND THEIR INDICATIONS.

By entering graphically on the map the general features of the weather and sky, we complete the detailed representation of the atmospheric condition. The clouds, by their kinds and changes, are indices to the relative temperature, moisture, and pressure existing at high altitudes: by their motions they indicate the nature of the prevailing current of air, showing whether it is from the tropics, and hence likely to be warm, or from the polar regions, and cool.

The ascent of expanding warm air gives rise to the cumulus clouds, whose flat bases are all on a pretty uniform level. These subside and dissolve when they cease to be fed by rising currents of moist air. The cirrus clouds are probably formed independently by the radiation of heat outward into the highest regions of the atmosphere, in which case they are composed of snow-flakes, or of spiculae of ice; and they are also formed of the remnants of the storm clouds, in which case they are generally composed of warmer vapor. The strong winds that attend areas of low barometer give rise, through the influence of friction, &c., as before stated, to ascending strata of moist air, in which, by expansion or cooling, as the case may be, are produced the scud and rain-cloud, of which there is a fine example in the easterly rains of the Atlantic Coast. This scud-cloud, which is at first like a cumulus of irregular shape, subsequently spreads into broad sheets of stratus and nimbus.

Two or more layers of clouds almost invariably coexist wherever extended rain-storms prevail, the upper layer stretching far in advance of the lower, but, descending and merging into the lower over the area on which rain is falling, frost abundantly. In the rear of this area cumulus clouds are abundant. A general survey of the map will show that cumuli or the cirri first mentioned in the preceding sentence are not inconsistent with fair and clear weather, as these terms are popularly used. An increased accumulation of large cumulus clouds may become cloudy weather, but does not generally presage the extended storms of winter. The cirrus of the second class, sometimes called cirro-stratus, almost always precedes at some distance any extensive storm, whether of winter or of summer. The stratus will generally be found to be reported in connection with threatening weather at the different stations.

The classification of clouds into cumulus, cirrus, &c., as originally given by Howard, is indicated on the accompanying plate.

GENERAL ATMOSPHERIC CURRENTS.

Without undertaking in this small volume to discuss the general circulation or system of the atmosphere, it is necessary to bear in mind a few general facts. The trade-winds on the surface of the earth, as is well known, steadily blow from the northeast and southeast in the respective hemispheres toward the meteorological torrid zone, which is a narrow belt where calms and clouds prevail at all seasons, and the uniformity of these winds is only disturbed, as in the Indian Ocean, by the unequal distribution of land and water in the two hemispheres. After reaching the equatorial regions as surface winds, the air must ascend to a great elevation, and thence move toward the polar regions in high upper currents, which descend to the earth in the region of the polar calms. It is probable that in this way are produced the northerly polar currents on the surface of the earth in high latitudes, but in the middle latitudes, in obedience to mechanical law, westerly winds prevail, which are known as the anti-trades.

In the temperate zone of the northern hemisphere the most frequent winds for eight or nine months are from the west or southwest, and allowing for the strength of the respective winds, the atmosphere is during the whole year carried to the eastward. The great currents that circulate around continental areas of high or low barometer, interfere with and even reverse this eastward motion in the temperate and westward motion in the tropical zone, but in the United States, north of the Gulf, any westward motion of the lower winds (and especially in the autumn, winter, and spring months) is to be considered as the result of a local disturbance, which may originate on the immediate surface of the ground, but frequently originates in the lower stratum of clouds. It is this disturbance that induces the surface winds from the northeast and southeast which blow nearly toward the storm center, while west winds prevail far above, and also on the western side. On the east side of a winter storm, and not far from its center, these easterly surface winds may extend for two miles upward above the earth, but at a considerable distance in advance of the central region they become weaker and more and more superficial. In the rear of a storm area the westerly winds which blow may be regarded as the upper current of air extending down to the earth's surface, and weakened by the retarding effect of friction, but accelerated by the flow of air in toward the area of low pressure.

In the trade-wind regions the easterly surface winds are the permanent and normal condi-

tion of the atmosphere, and equally so are the southwest winds that prevail above. The line that divides the north tropical from the north temperate climate (the meteorological Tropic of Cancer) moves northward during the summer months, so that, for instance, the ocean in the latitude of New Orleans, during the summer, is generally covered by easterly winds, while high above the southwest wind prevails. This normal movement, north in summer and south in winter, of the system of winds is, however, so greatly mollified by the effect of continental heat upon the distribution of the atmosphere, and consequently upon the winds, that it would be not improper to say that in winter the winds tend to circulate around the center of continents in the direction of the motion of the hands of a watch; in the summer, in the contrary direction. The disturbing effect of the unsymmetrical distribution of continents and oceans, water thus transforms into mingled vertical and horizontal currents, the system of three simple vertical currents that Ferrel has shown would exist in the temperate zones if the earth's surface was all land or all water, of uniform absorbing and radiating power.

THE DIRECTION AND PROGRESS OF STORMS.

The previous considerations have been confined to the study of a few isolated charts of the weather. But in comparing the indications of a series of these, constructed as are those of this office, thrice daily, the student is at once struck with the regularity with which the areas of stormy and clear weather move over the surface. The lines of high and low pressure, the areas of high and low temperature, &c., are in continual motion generally to be eastward, except for the regions south of 30° of latitude, where the movement is westward in summer; they may change in their details, but their features are always identifiable in each successive chart until they have passed the limits of the map, and other phenomena have succeeded. The rapidity of the easterly movement may occasionally amount to fifty miles per hour, but probably averages less than thirty miles.

In this connection it may be well to notice an important generalization recently published by the London Meteorological Office, as deduced from the logs and special observation of the Cunard steamships plying between New York and Liverpool, i. e., that a vessel bound to the westward meets advancing areas of low pressure, and the observer finds that his barometer falls and rises again more rapidly than it would were he on shore, while an observer on board of a ship bound to the eastward has just the reverse experience. Instances occur in which steamers bound from New York to Liverpool overtake severe cyclones, and sometimes outstrip the eastward moving area of low pressure—a fact which, taken with what has been now advanced, clearly indicates that a number of successive barometrical depressions, each with its own cyclonic wind system, are moving across the Atlantic, somewhat after the manner in which eddies pursue each other down the current of the river. The movement of these areas of low pressure, for both hemispheres, has been observed, on the ocean, to be eastward between the latitudes of 35° and 50° .

The controlling influences which determine the course that a given storm-center, or, in fact, any area, whether of clear or warm or stormy weather, may be considered as follows:

1. There is a decided tendency of areas of low pressure to move northward more rapidly than southward, and the reverse for areas of high barometer. These tendencies are, respectively, strongest in the latitude of 45° . This principle, which is a deduction from the mathematical theory of the atmospheric currents, is confirmed by observation.

2. Storms of considerable extent disturb the atmosphere to a sufficient height to have their course determined by that of the upper currents of air; i. e., the southwest current in the North Temperate Zone.

3. Storms of less extent—for instance, the local summer thunder-storms—are carried along by the general winds of the lower strata of air. These, however, are determined by the existence of the continental and oceanic areas of high and low pressure, whose changes from month to month may be seen in the charts of monthly isobarometric lines. Thus it is that, with but very few exceptions, the storms that have been traced to any distance from April to October are found to move about the tropical areas of high barometer, in the Atlantic and Pacific Oceans, in the direction corresponding to the movement of the hands of a watch; and in the contrary direction, about the area of low barometer in the interior of North America, those traced during the winter months move about the area of high barometer, in the interior of the continent, in the direction of the movement of the watch hands.

These great areas of high pressure are, however, ever varying in outline and position, thus giving rise to changes in the storm-paths.

4. The central low pressure produces a fall in the barometer in all directions about it; wherever that fall is accompanied with a deposition of vapor, a further fall will be thereby induced—consequently, the storm-center will be drawn in that direction.

On becoming familiar with the extent of the changes that may be produced by the heat of day and the cold of night, it is learned that from September to May such daily changes rarely or never interrupt the progress of storms when they have once set in; they exert but a subordinate influence, compared to that exerted over the atmosphere by the central area of low pressure, which appears to maintain the storm, so long as it is supplied with moist air.

Storms may increase and decrease in severity as they move along through moist or dry

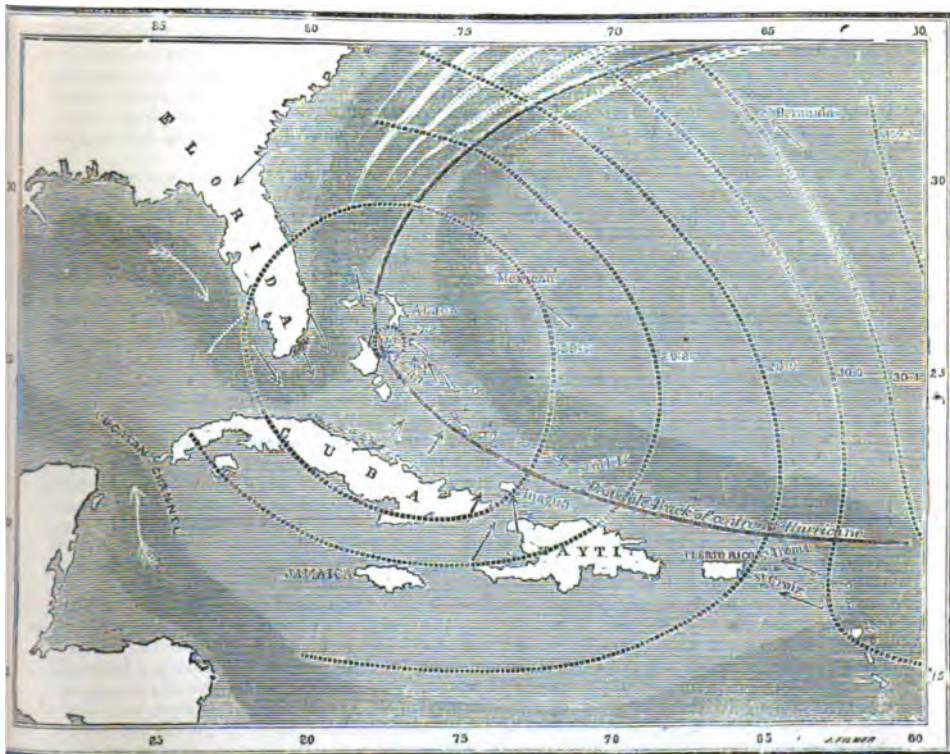
regions of air, respectively; and the change is accompanied by a corresponding fall or rise in the barometer at the central area, and an expansion or contraction of the storm-area.

It is especially necessary, in determining the storm-path, to bear in mind the motion of the upper stratum of air. Over the country north of the Gulf of Mexico, there generally prevail, (as upper currents,) in the higher regions of the atmosphere, southwest, west, northwest, or north, and rarely northeast winds, according to the season, and the distribution of atmospheric pressure, and these are those that principally determine the general movement of storms, &c. The thin-surface stratum of air is comparatively quiescent, or is at different points moving simultaneously in opposite directions, while overhead the whole body of air is moving onward with a far more uniform direction and velocity.

In this connection, the reports of winds from the top of Mount Washington are of interest for New England, although that station can hardly be considered as always in the upper current. The phenomena of storms in the United States may be well comprehended if we consider the office of the lower strata (within two miles) to be to carry vapor hither and thither; that of the upper strata, on the other hand, by successive aerial waves and tides, to subject the lower strata to alternate compression and dilatation, thus giving rise, respectively, to clear and cloudy weather, which latter becomes at times rainy, and is then the center of a local low barometer, and its system of circulating winds.

STORMS AND CYCLONES.

Whether of snow, rain, or wind, whether of greater or less violence, storms and cyclones have much similarity in their general features and behavior; strong contrasts of temperature, and of pressure in contiguous currents of warm and cold air, mark the progress, and also the origin, of a storm. The Gulf Stream, and the adjacent areas of colder water; the land bordering on oceans or lakes, whether frozen or open; mountains and plains, and river valleys, are examples of regions over which moist and dry, or warm and cold strata, come in contact; but even more important, though imperfectly understood, are the sudden changes that take place overhead, which are apparently due to the elevation of moisture into the higher regions of the atmosphere. The storms that visit the United States may be described as of four types, as follows:



1st. The West India cyclones, originating in the southern regions of the zone of easterly trade-winds, and generally east of the Windward Islands, possibly even in the Meteorological Torrid Zone or equatorial belt of calms and rains. A low pressure and large humidity mark their central region; toward this the winds blow from all points, and, deflecting to the right, pursue their spiral course inward and upward; at least this is the only satisfactory explanation that has yet been offered for the various phenomena. The moisture brought by this wind condenses as the pressure is reduced, and clouds are formed, with heavy rain.

At the center of a cyclone an upward current is supposed to exist, and high above are formed the cirrus clouds, which stream far away in advance on the upper currents of air. These storms are carried to the north and west, until they pass into the meteorological temperate zone, where the prevailing south and west winds control their motions. This generally happens on or opposite the South Atlantic coast, and as the storms then pursue a course nearly parallel with the Gulf Stream, with its attendant band of warm moist air, they produce heavy easterly gales on our East Atlantic coast, and finally are lost in the Northern Atlantic, but occasionally, doubtless, reach Iceland and the coast of Great Britain.

Instances are not wanting in which these heavy storms have passed across the Gulf to Texas, thence northward to the lakes, and northeast to Maine, widening the area of disturbances, and gradually changing into extended rains with moderate winds; thus differing from the Atlantic storms only in that their path is farther westward and that southwest gales are produced in the Eastern States.

2d. The autumn, winter, and spring rains, which generally first announce themselves on the southwest or western plains of this country, may be regarded as disturbances originating on the northern confines of the tropical zone and on the Pacific slope (as distinct from those of the preceding class that originate in the West Indies.)

From the area of high pressure on the Pacific coast of central and North America, a volume of moist air is forced up over the Sierra Nevadas and Rocky Mountains; its moisture is deposited, and a wave of rarified but probably dry air is started on its northeast or eastern course. No sooner does this arrive as a wave of low barometer over the comparatively moist air of the Mississippi Valley, than, by relieving the surface stratum of its pressure, there at once begins the condensation of its moisture, which process, if the air is not too dry, goes on rapidly increasing.

Local currents arising in this surface stratum of air feed the central area of condensation, which soon becomes hazy, and then cloudy until rain begins. While the general progress of the storm-center will be northeastward, yet it is evident that wherever the moistest air exists, there the condensation will take place the most rapidly; there the barometer will also fall the most rapidly; and thither the storm will be strongest drawn. Such storms naturally, therefore, move very rapidly up toward the lakes, and hang tenaciously over them, and move slowly away from them. In winter their course is eastward, in the early autumn northeastward.

The temperature of the upper regions must decide whether rain or snow will attend these storms. Their advance is almost invariably heralded by an increase of temperature, due apparently to latent heat evolved by the condensation going on in the circumjacent and superior air and radiated downward to the earth, and to the increased facility with which the saturated air on the surface absorbs the heat radiated by the earth.

Following the increase of temperature the cirrus clouds are observed, which geographically precede the stratus and the rain. The lowest pressure is felt on the earth after the rain has begun to fall. Although often these storms pass over without rain, until they near the lake district or Eastern States, yet their first cause may be traced back to the changes going on in the southern and western limits of the United States; at least two such have been actually followed during the four or six days occupied in passing from the California coast to Nova Scotia, and many instances are recorded of those that have passed from Texas over Lakes Superior and Huron.

3d. Well-defined, though generally weak disturbances, have been observed to pass from the north to the south, or the northwest to the southeast, but these are probably rare in the United States and probably occur only in midwinter, when the northeast winds and high pressure in British America are exceptionally strong. Continuous snow succeeded by cold, dry weather characterize these storms, and such a one, on one occasion during the past winter, after striking the coast of Alabama and turning eastward ascended the Gulf Stream to the northeastward, thus coursing around the area of high pressure that had then pushed itself southward over the lake region.

4th. The storms which are generally confined within the United States are the northern, tornadoes, and thunder-storms. The latter are generally spread over a very narrow space, so that they may at times pass between the stations from which our reports are received. These storms evidently originate in the lower-cloud stratum in local but intense differences of temperature, moisture, and pressure, and are believed in general to prevail only on the western side or in the rear of areas of high pressure. The gyratory movements of these small storms depend upon local currents and resistances rather than on the earth's rotation: they may, therefore, gyrate either toward the right or the left. In these storms the cumulus clouds are particularly remarkable for their height, and the cirrus clouds for their small

extent. The presence of a surface area of dry air is oftentimes sufficient to dissipate these storms, or to cause them to retire into the cloud regions. Similar storms form over mountain-tops, and are experienced by balloon voyagers when the air is quite undisturbed below. Several such smaller storms frequently simultaneously coexist, pursuing parallel paths, circulating with the general winds about the continental areas of low barometer, and the area of local storms thus corresponds very nearly to what would be an area of general rain were the temperature lower over the region. The lightning which accompanies these storms is the effect of the concentration upon large drops of water of the electricity previously distributed throughout the invisible vapor.

5. It has been noticed that there is a tendency in the spring and summer toward an accumulation of barometric pressure over the Middle and Eastern Atlantic States. When this area of high barometer moves eastward the easterly winds on its south side driving on to the coast from Maryland to Massachusetts produce clouds and occasionally severe storms of small extent, which are driven north and westward until broken up among the Appalachian Mountains.

THE PREDICTION OF STORMS.

The wind is that element which most affects the commercial interest of the country, and, in forecasting the approach of a storm, a student at present naturally gives his principal attention to this element; the prevalence of fog, rain, or snow, and the temperature of the air, may, however, be estimated in a general way. In making use of the weather bulletin and chart for the purposes of prediction for any region of the country different from that in which the student is at the moment residing, he is, of course, cut off from the use of many local rules which would influence his judgment were he at the time there present, and able to know by personal observation all the minutiae of the atmospheric condition. If deprived of these important helps, and forced to rely exclusively upon the bare numerical data offered by the bulletin, he must call to his aid all such knowledge as is offered by the preceding brief statement of the prominent meteorological principles, such local laws as he may know to hold good for the districts in question, and such more general laws as have been deduced by the study of eminent meteorologists. A number of these latter will be found in the appendix.

The local laws referred to are now being collected at the office of the Chief Signal Officer, and will eventually be published in such a manner as to make them practically available. At present such general laws are prescribed as seem most applicable to this continent.

The general direction of the wind over any region is given by the table on page 89, supposing it to be known where the continental and oceanic areas of high and low pressure exist. The local wind may be deduced from the general wind by due consideration of local friction and other resistances, as well as of the existence of secondary and smaller areas of low or high pressure. The force of the wind at any locality depends primarily upon the rapidity with which the pressure is changing at that point, as indicated to some extent by the crowding of the isobaric lines, but is greatly modified by the local topography, as before explained on page 90. The effect of lakes and hills in altering the winds will, at some future time, be published in detail, the present data being scarcely sufficient for most of the stations.

The prediction of an extended storm for any portion of the country, therefore, is reduced to the *determination of the path pursued by the central area of low pressure*, and the rapidity with which this will extend its influence in any given direction.

It frequently happens that two or more areas of low pressure may be defined; when such is the case the areas seem to influence each other as to their extent, outline, and course of progression.

The rapidity of movement is a physical question that cannot yet be solved numerically; but, in general, it is known that for the same temperature, the moister the air, or the greater its relative humidity, the greater will be the effect of a general diminution of pressure or temperature, in inducing condensation and a further fall of the barometer.

As regards the path pursued, it has already been stated that large areas of high pressure are known to exist in the northern hemisphere, and the small areas of low barometer that constitute the nuclei of storms have been observed to move around the borders of these greater areas; which latter, however, are by no means stationary.

Fortunately, however, the general reader may be spared the trouble of the numerical estimate of the resultant of a number of mechanical forces, for the clouds themselves indicate several hours in advance the probable direction of progress of these storms, since the clouds actually form first in those regions in which the falling pressure or temperature has the greatest influence in condensing the moisture.

The general distribution of the principal masses of cirrus and cirro-stratus clouds, combined with the distribution of the areas over which the temperature and pressure have risen or fallen with abnormal rapidity, will safely indicate, at least for the winter months, the immediate region into which the storm will pass, and occasionally even give a premonition of its breaking up into two portions, each drawn in different directions.

The more violent winds generally follow in the rear, and on the south side of the advancing-area of lowest pressure; those that precede the progress of that area may often be more

dangerous, however, because of the accompanying rain, fog, &c. The latter winds are preceded by the cirrus and threatening storm-clouds; the rain that accompanies or follows these generally abates, and thus gives warning of the strong clearing-up winds.

The rapidity of progression of the area of cloud and rain varies from fifteen to sixty miles in an hour, the actual velocity varying with the influence of moisture, as explained in a previous section.

The average velocity of the currents, which determine the general direction of the progress of the nucleus of the storm, varies from twenty to forty miles hourly, and rarely reaches the higher limit.

Allusion has been made, in the earlier pages, to the fact that the barometric observations at very high stations cannot be combined with those taken simultaneously at lower stations in drawing our isobaric lines. This is the result, partly, of ignorance of the laws of diminution of moisture and temperature actually prevailing at the station, which laws vary with the hour of the day, the seasons, and the state of the weather, and still more is it the result of the extraordinary changes that are continually taking place in those upper regions, and which are but very sluggishly followed by the lower strata.

The barometric and thermometric changes that are reported from Mount Washington, for instance, sometimes afford sure premonitions of a change in the general character of the weather, and with great frequency foreshadow the storms that pass directly over New England.

It is by increasing the mountain stations, and by adding such balloon observations as can be made, and specially by the study of the forms, changes, motions, height, and velocity of the clouds, and of the optical phenomena of the atmosphere, that meteorologists hope eventually to arrive at a full knowledge of the regions of the air where the severe storms are propagated.

The following appendix contains a number of important generalizations and laws given in the language of the original sources from which they are extracted.

Tables are added for the calculation of the relative humidity of the atmosphere.

PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Eleventh meeting, held at Montreal, C. E., August, 1857.

LEADING PRINCIPLES OF REDFIELD'S THEORY OF STORMS AS DEVELOPED BY HIM FROM 1831 TO 1857.

That all violent gales or hurricanes are great whirlwinds in which the wind blows in circles around an axis either vertical or inclined; that the winds do not move in horizontal circles, as the usual form of his diagrams would seem to indicate, but rather in spirals toward the axis, a descending spiral movement externally and ascending internally.

That the *direction of revolution* is always uniform, being from right to left, or against the sun, on the north side of the equator, and from left to right, or with the sun, on the south side.

That the *velocity of rotation* increases from the margin toward the center of the storm.

That the whole body of air subjected to this spiral rotation is at the same time *moving forward* in a path at a variable rate, but always with a velocity much less than its velocity of rotation; being at the minimum hitherto observed as low as four miles, and at the maximum forty-three miles, but more commonly about thirty miles per hour, while the motion of rotation may be not less than from one hundred to three hundred miles per hour.

That in storms of a particular region, as the gales of the Atlantic or the typhoons of the China Seas, *great uniformity exists in regard to the path* pursued: those of the Atlantic for example, usually issuing from the equatorial regions eastward of the West India Islands, pursuing at first a course toward the northwest as far as the latitude of 30 degrees, and then gradually wheeling to the northeast, and following a path nearly parallel to the American coast, to the east of Newfoundland, until they are lost in mid-ocean; the entire path when delineated resembling a parabolic curve whose apex is near the latitude of 30 degrees.

That their *dimensions* are sometimes very great; being not less than one thousand miles in diameter, while their path over the ocean can sometimes be traced for three thousand miles.

That the *barometer* at any given place falls with increasing rapidity, as the center of the whirlwind approaches, but rises at a corresponding rate after the center has passed; and finally,

That the phenomena are more uniform in large than in small storms, and more uniform on the ocean than on the land.

Tenth meeting, held in Albany, N. Y., August, 1859.

V.—METEOROLOGY.

I.—ON THE SPIRALITY OF MOTION IN WHIRLWINDS AND TORNADOES, BY W. C. REDFIELD, OF NEW YORK.

I. An aggregated spiral movement, around a smaller axial space, constitutes the essential portion of whirlwinds and tornadoes.

II. The course of spiral rotation, whether to the right or left, is one and the same in this respect throughout the entire whirling body, so long as its integrity is preserved. But the oblique inclination which the spiral movement also has to the plane of the horizon is in the opposite directions as regards the exterior and interior portions of the revolving mass. Thus in the more outward portion of the whirlwind the tendency of this movement is obliquely downward, where the axis is vertical; but in the interior portion, the inclination or tendency of the spiral movement is upward. This fact explains the ascensive effects which are observed in tornadoes and in more diminutive whirlwinds.

III. Owing to the increased pressure of the circumjacent air in approaching the earth's surface, the normal course of the gradually descending movement in a symmetric whirlwind is that of an involuted or closing spiral; while the course of the interior ascending movement of rotation is that of an evolved or opening spiral. Hence the horizontal areas of the higher portion of the whirl exceed greatly those of its lower portions.

IV. The area of the ascending spiral movement in the vortex, as it leaves the earth's surface, is by far the smallest portion of the whirling body for the reason that the rotation here is proportionally more active and intense, being impelled by the aggregated pressure and movement of the more outward portion of the whirlwind as it converges from its larger areas, on all sides, by increasingly rapid motion, into the smaller areas of ascending rotation.*

That this interior portion of the whirl resembles an inverted hollow cone, or column, with quiescent and more rarefied air at its absolute center, may be inferred from the observations which have been made in the axial portions of the great cyclones. Into this axial area of the tornado, the bodies forced upward by the vortex cannot fall, but are discharged outwardly from the ascending whirl. The columnar profile of this axial area sometimes becomes visible, as in the water-spouts, so called.

V. Accessions caused by circumjacent contact and pressure are constantly accruing to the whirling body so long as its rotative energy is maintained. A correlative diffusion from its ascending portion must necessarily take place toward its upper horizon; and this is often manifested by the great extent or accumulation of cloud, which results in this manner from the action of the tornado. In other words, there is a constant discharge from the whirling body in the direction of least resistance.

VI. The spirality of the rotation and its inclination to the horizon, in the great portion of the whirl, which is exterior to its ascending area, are not ordinarily subject to direct observation; nor is the outline or body of the more outward portion of the whirlwind at all visible otherwise than in its effects.

VII. In aqueous vortices the axial spirality of the exterior and interior portions of the whirl are in reverse direction to those in the atmosphere, the descending spiral being nearest to the axis of the vortex. Hence lighter bodies and even bubbles of air are often forced downward in the water, in the manner in which heavier bodies are forced upward in the atmosphere.

FOURTH METEOROLOGICAL REPORT, BY PROFESSOR J. P. ESPY, WASHINGTON, JULY, 1854.

8. GENERALIZATIONS.

1. The rain and snow storms, and even the moderate rains and snows, travel from the west toward the east in the United States, during the months of November, December, January, February, and March, which are the only months to which these generalizations apply.

2. The storms are accompanied with a depression of the barometer near the central line of the storm, and a rise of the barometer in the front and rear.

* The law of increment in the velocity of the whirlwind as it gradually converges into lesser areas, by its spiral involution, is that which pertains to all bodies when revolving around inferior foci toward which they are being gradually drawn or pressed nearer and nearer in their involute course: the line of focal or centripetal pressure thus sweeping equal areas in equal times, at whatever diminution of distance from the center, except as the velocity may be affected in degree by the resistance of other bodies.

Such resistance is of little effect in a tornado, because its revolving mass is mainly above all ordinary obstacles, such as orchards and forests. Into which the spiral descending and accelerated blast, near the contracted extremity of the inverted and truncated cone of the whirl, penetrates with constant freshness and intensity of force already acquired in the higher and unobstructed region.

3. This central line of minimum pressure is generally of great length from north to south, and moves side foremost toward the east.
4. This line is sometimes nearly straight, but generally curved, and most frequently with its convex side toward the east.
5. The velocity of this line is such that it travels from the Mississippi to the Connecticut River in about twenty-four hours, and from the Connecticut to St. John, Newfoundland, in nearly the same time, or about thirty-six miles an hour.
6. When the barometer falls suddenly in the western part of New England, it rises at the same time in the valley of the Mississippi, and also at St. John, Newfoundland.
7. In great storms the wind for several hundred miles on both sides of the line of minimum pressure blows toward that line directly or obliquely.
8. The force of the wind is in proportion to the suddenness and greatness of the depression of the barometer.
9. In all great and sudden depressions of the barometer there is much rain or snow; and in all sudden great rains or snows there is a great depression of the barometer near the center of the storm, and rise beyond its borders.
10. Many storms are of great and unknown length from north to south, reaching beyond our observers on the Gulf of Mexico and on the northern lakes, while their east and west diameter is comparatively small. The storms therefore move side foremost.
11. Most storms commence in the "far west," beyond our most western observers, but some commence in the United States.
12. When a storm commences in the United States the line of minimum pressure does not come from the "far west," but commences with the storm, and travels with it toward the eastward.
13. There is generally a lull of wind at the line of minimum pressure, and sometimes a calm.
14. When this line of minimum pressure passes an observer toward the east, the wind generally soon changes to the west, and the barometer begins to rise.
15. There is generally but little wind near the line of minimum pressure, and on each side of that line the winds are irregular, but tend outward from that line.
16. The fluctuations of the barometer are generally greater in the northern than in the southern parts of the United States.
17. The fluctuations of the barometer are generally greater in the eastern than in the western part of the United States.
18. In the northern parts of the United States the wind generally in great storms sets in from the north of east and terminates from the north of west.
19. In the southern parts of the United States the wind generally sets in from the south of east and terminates from the south of west.
20. During the passage of storms the wind generally changes from the eastward to the westward by the south, especially in the southern parts of the United States.
21. The northern part of the storm generally travels more rapidly toward the east than the southern part.
22. During the high barometer on the day preceding the storm it is generally clear and mild in temperature, especially if very cold weather preceded.
23. The temperature generally falls suddenly on the passage of the center of great storms, so that sometimes, when a storm is in the middle of the United States, the lowest temperature of the month will be in the west on the same day that the highest temperature is in the east.

Some of the storms, it is true, are contained entirely for a time within the bounds of my observers, and in that case the minimum barometer does not exhibit itself in a line of great length, extending from north to south, but it is confined to a region near the center of the storm, and travels with that center toward the eastward.

From these experiments it may safely be inferred, contrary to the general belief of scientific men, that *vapor permeates the air from a high to a low dew-point with extreme slowness, if indeed it permeates it at all*; and in meteorology, it will hereafter be known that *vapor rises into the regions where clouds are formed only by being carried up by ascending currents of air containing it*.

Extract from letter of S. C. Walker, March, 1837.

Dr. Franklin first ascertained that all storms travel toward the northeast.

Mr. Espy's researches led him to believe that this constancy of direction is confined to our winter storms and summer tornadoes. He has also found, from observations furnished by Professor Hamilton, that in the winter season the rise of barometer, as well as the presence of the center of the storm, takes place at Nashville, Tennessee, about twenty-four hours earlier than at Philadelphia. And here I would remark that Dr. Emerson is the first observer, so far as my knowledge extends, who noticed that a great rise of the barometer is a prelude to a northeasterly storm, a conclusion to which Mr. Espy has arrived *a priori* from his theory of storms.

This conclusion is in direct opposition to popular opinion, and, indeed, to that of most philosophers, who have marked set fair on the barometer at one inch above the mean.

The valuable mathematical essay of Professor William Ferrell, published in 1856, (and a second edition in 1860,) "On the Motions of Fluids and Solids on the Surface of the Earth," specifies the following general laws as applicable to our atmosphere:

GENERAL MOVEMENT OF THE ATMOSPHERE.

Assuming that there is absolutely no friction between the atmosphere and the face of the earth, and regarding the latter as a sphere rather than an oblate spheroid, we have for the general condition of the atmosphere the following conclusions:

The atmosphere, however deep it may be at the equator, cannot exist at the poles.

The exterior surface of the atmosphere would be slightly depressed at the equator, and have its maximum height about the parallel of 35° , and meet the surface of the earth near the poles.

At the latitude of maximum height, the atmosphere would have no motion east or west.

Between the parallel of 35° and the poles the motion is eastward, but between those parallels and the equator it is toward the west.

LOCAL MOVEMENTS.

Under the same assumption of no friction, we have for a small circular portion of air rotating horizontally on the earth's surface:

The air, however deep it may be at the extreme boundary, cannot exist at the center.

The upper surface of the revolving portion of air will be very slightly convex, and meet the surface of the earth near the central axis of revolution.

There will be no gyratory motion at the region of maximum height of the air.

The inner part of the fluid will gyrate from right to left, (i. e., opposed to the motion of the hands of a watch,) but the external part from left to right.

If the fluid gyrate from right to left, the whole mass has a tendency to move toward the north, but if from left to right, toward the south.

In whatever direction a body moves on the surface of the earth, there is a force arising from the earth's rotation which deflects it to the right in the northern hemisphere, but to the left in the southern.

GENERAL MOVEMENT, TAKING ACCOUNT OF FRICTION AND VARYING DENSITY.

Although the preceding results, when applied to the atmosphere, are very much modified by the resistances of the earth's surface, yet they will be of great advantage in explaining its general motions; for as there can be no resistance until there is motion, the atmosphere must have a tendency to assume in some measure the same motions and figures as in the case of no resistances. Hence, toward the poles the general motions of the atmosphere must be toward the east, and in the torrid zone toward the west; there must also be a comparatively small depression at the poles and at the equator.

There must be a region of calms about the poles, and a belt of calms at the equator, (the latter belt lying a short distance north of the exact equator.)

The belt of calms, which, in the case of no friction, it was previously shown, must exist at the parallels of 35° , will be moved toward the equator nearly to the parallels of 30° , (and nearer the equator in the northern than in the southern hemisphere.)

The lesser friction of air moving over air than over the earth causes an additional accumulation of atmosphere at the tropical belts, the overflow of which, combined with the westerly and easterly motions of the atmosphere, gives rise to the fresh northeast trade-winds of the northern hemisphere, and to the southwest surface-currents of the temperate zone.

The cold air of the polar regions gives rise to the very superficial, weak, northeasterly winds of the arctic zone.

A belt of calms must exist within the polar circles. The system of belts of calms and winds on the earth's surface must be distorted from absolute symmetry by the influence of continents and oceans, and ocean-currents; and the respective belts must change their positions somewhat during the year, as the sun varies his declination; moving southward in the fall, and northward during our spring. The upper currents of air are from the southwest over the entire northern hemisphere; but a middle current (or perhaps a local superficial current) from the northeast may exist in the temperate zone.

LOCAL MOVEMENTS—CYCLONES.

Whenever, by reason of local rarefaction or other cause, an upward current is established at any place, fed by moist surface-currents, the surrounding atmosphere assumes a gyratory motion, but the resistances cause a calm at the exact central area, the most rapid motion being on the immediate outer limit of this area. The contrary gyrations above indicated, as existing on the outer rim of the cyclone, where no frictional resistance is present, are in this case generally destroyed by such resistance. The gyrations will be from right to left in the northern hemisphere. At the equator there will be no gyratory motion, and consequently no

cyclones. The effect of the earth's rotation in determining the direction of rotation of a cyclone is very small where the disturbance extends over a small area, hence tornadoes, properly so called, depend for their gyrations more upon the initial state of the atmosphere, and may rotate in either direction; hence tornadoes, but not cyclones, may be experienced at the equator.

The force that maintains the gyrations of a cyclone being one in constant action, they perpetuate themselves from hour to hour, and for many days; while in tornadoes the resistance of the earth and air soon overcome the initial gyratory tendency.

The great depression of the barometer in tornadoes and cyclones is caused, not so much by the rarefaction of the air by expanding moisture, though this ordinarily gives the first start to the whirlwind, but principally by the centrifugal (not the tangential) force due to the rapid motion of the particles of air near the center.

As there is less resistance in the upper strata, the rapid gyratory motion commences there first.

The interior portions of cyclones always gyrating, as they do, from right to left in the northern hemisphere, must always move toward the north pole; while between the equator and the tropical calm-belt they are carried westward by the general motion of the atmosphere, but after passing this belt the general atmospheric movement carries them eastward.

Near the equator they must move slowly toward the poles, but after passing the tropical calm-belt the motion of progression must be accelerated.

The progression of small tornadoes is dependent almost entirely upon that current of air in which they exist, and the general tendency of all small disturbances is to run into the largest belts of low pressure.

The following generalizations are deduced by Professor J. H. Coffin, in his exhaustive memoir "On the Winds of the Northern Hemisphere:"

In the arctic regions of North America, lying within the polar circle, the mean direction of the wind is about north-northwest, and well defined.

Between the parallels of 60° and 66° there appears to be a belt of easterly or northeasterly winds, whose pole is at about latitude 84° and longitude 26° west of Washington.

Passing south of this circle, we find a belt of westerly winds, about $23\frac{1}{2}^{\circ}$ in breadth entirely encircling the globe, and the poles of whose southern and northern limits very nearly coincide with that of the preceding belt.

Near the limits which divide this zone from its neighbors the progressive motion of the wind is very small; the progression is less in Europe than in America.

Passing south of this (the temperate) zone we find that contiguous to it the winds are at the whole easterly, yet quite irregular, and having a very small progressive motion.

Farther south we fall in with the well-known northeasterly trade winds, showing marked prevalence between latitude 10° and 25° than nearer the equator.

On each side of the Atlantic ocean there is a systematic change in the winds prevailing during the different seasons of the year similar to the monsoons of Asia.

On the Atlantic coast of North America the monsoon character is more marked than on the European coast, and more marked on the coast than in the interior; but again becomes well marked as we near the elevated plains west of the Mississippi.

BLODGET'S CLIMATOLOGY OF THE UNITED STATES.

Dr. Gibbons has noticed with great care at San Francisco the course of the higher strata of clouds—the cirrus and the very high stratus—when they were visible, and has found them to come uniformly from some westerly point, as he had also observed for many years at Philadelphia. The writer has long observed the same facts in Western New York, where an average of not more than one instance annually occurs of clouds in the higher strata moving from any other than a westerly point. During three years of very careful registry directed to this particular point, but three instances of a contrary direction were observed; and these were during the prevalence of extensive and disastrous storms on the Atlantic coast. The lower clouds are from various points, and the wind is quite variable during the great storms, two strata of different movement often lying beneath that from the west, yet the stratum from a westerly point usually deposits the rain, and when it ceases the rainfall ceases, though the lower strata may continue to run on the wind twenty-four hours or more longer.

The invaluable charts of Mr. Buchan, showing the average barometric pressure and winds for each month of the year, together with the many detailed generalizations, can only be referred to here. The following, however, seem to sum up his results:

"An examination of the isobaric and wind charts for the months shows, as has been already pointed out, that where there is a mean low pressure, such as occurs in the north of

* Transactions of The Royal Society of Edinburgh, vol. xxv, Mr. Alexander Buchan on the mean pressure of the atmosphere, &c.

the Atlantic in the winter months, and in the center of Asia in the summer months, thitherward the winds tend in all directions in an inmoving spiral course; and where there occurs a mean high pressure, as in the center of Asia in winter and in the Atlantic, between Africa and the United States, in summer, out of this space the winds flow in all directions, or they appear to be thrown out from the space of high pressure in a manner exactly the reverse from that by which they are drawn inward upon a space of low pressure."

Pliny Earle Chase, in the proceedings of the American Philosophical Society, 1871, March 3, among other results gives the following:

"The wind, especially in the Southern States, often blows directly in the line of the greatest barometric gradient. But even in such cases, after a few hours' continuance, it tends toward the azimuth indicated by Buys Ballot's law.

"The isobaric lines are therefore often of less relative importance than the gradients in forming forecasts.

"Currents with an anti-cyclonic tendency, controlled by areas of high barometer, are notably common.

"Our recent storms have been anti-cyclonic, and there seems some reason for supposing that anti-cyclones are the usual weather-breeders, even of such of our land storms as become more or less cyclonic after they are fully developed.

"The precipitation of vapor of course gives rise to local cyclones, which, however, may be easily and speedily overborne by the grand anti-cyclonic whirls of a half million miles or more in area."

Extracts from "Barometer Manual," compiled by Robert H. Scott, for the meteorological office, London, 1871.

RULES TO EXPLAIN THE INDICATIONS OF THE INSTRUMENTS.

It should always be remembered that changes in weather generally give signs of their coming, for the instruments are affected before the wind actually begins to blow or the rain to fall; thus they may be said to enable us to feel the pulse of the atmosphere. It must not be forgotten that the length of time which passes between the first appearance of a change of weather and its actual setting in are not the same. It is much greater when a southwest wind is going to succeed a northeast wind than when the opposite change is about to take place. We shall see, a little further on, why this is the case, and also how the appearance of the sky will aid us in forming an opinion as to probable weather.

The general principles on which the following rules are founded have been laid down by Professor Dove, of Berlin, on the basis of a long series of observations, which were made at several stations situated in the north temperate zone, between the parallels 49° and 65°, to which regions they specially refer. The rules themselves may be shortly stated thus:

The average height of the mercury in the barometer, at sea-level, in the British Islands, is about 29.9 inches. If the barometer rises steadily above its mean height while the weather gets colder and the air becomes drier, northwesterly, northerly, northeasterly winds; or less wind, less rain, or snow, may generally be expected. On the contrary, if the barometer falls while the weather gets warmer, and the air becomes damper, wind and rain may be looked for from the southeast, south, or southwest.

The deviations from these general principles which are noticed correspond to the various changes of weather.

If the weather gets warmer while the barometer is high and the wind northeasterly, we may look for a shift of wind to the south. On the other hand, the weather sometimes becomes colder while the wind is southwesterly and the barometer low, and then we may look for a sudden squall, or perhaps a storm, from the northwest, with a fall of snow if it be winter time.

No absolute laws for weather can, however, be laid down; the most striking exceptions to the rules are those noticed by Admiral Fitz Roy. They occur with northeast winds, which sometimes bring rain, or sleet, or snow, especially during gales, although the barometer may be high and rising. On the other hand, when the wind is northeasterly and light, and the barometer begins to fall, rain may set in before the wind changes to east or east-southeast.

Besides these rules for the instruments, there is a rule about the way in which the wind changes, which is very important. It is well known to every sailor, and is contained in the following couplet:

When the wind shifts against the sun,
Trust it not, for back it will run.

The wind usually shifts *with the sun*, i. e., from left to right* in the northern hemisphere. A change in this direction is called *veering*.

Thus an east wind shifts to west through southeast, south, and southwest, and a west wind shifts to east through northwest, north, and northeast. If the wind shifts the opposite way, viz, from west to southwest, south, and southeast, the change is called *backing*, and it seldom occurs, unless when the weather is unsettled. However, slight changes of wind

* In the southern hemisphere motion *with the sun* is, of course, from right to left.

do not follow this rule exactly; for instance, the wind often shifts from southwest to south and back again.

In most parts of the world it has been observed that there are two prevailing wind-currents, which vary with the circumstances of the place, but are, on the whole, nearly opposite each other.

In these islands these directions are about northeast and southwest, and the latter of these winds blows for about ten times as many days in the year as the other does.

What is it that causes these winds to blow and makes them so different from each other as we know them to be? The simplest account of them is that the air is always flowing toward the equator from the poles, and back again. It then forms two great currents; one is called the polar current, as it flows from the direction of the pole, and is felt here as a northeast wind; the other is called the equatorial current, as it flows from the direction of the equator, and is felt here as a southwest wind.

The air of the polar current has been chilled, and is heavy, cold, and dry; while it is blowing the barometer is high and the weather usually dry.

The air of the equatorial current has been heated, and is light, warm, and moist; while it is blowing the barometer is low and the weather usually wet.

If we keep the idea of these two great wind-currents clearly in our heads, we shall easily understand most of the signs of the weather which are noticed.

The air of the equatorial current is lighter than that of the polar, and so southerly winds will begin to blow aloft before they are felt on the ground, while northerly winds will begin to blow close to the ground. Accordingly southwest winds give much more warning of their coming than northeasterly ones.

The southwest wind will often show itself first by long streaks of cirrus clouds at a great height, called "mare's tails;" or, when a gale is very near, by driving scud.

Signs of weather, such as those just noticed, are important to any one watching for changes, as they will enable him to confirm or modify the opinions formed from the behavior of his instruments. As to the instruments themselves, we have already seen that when the barometer rises, owing to a change of wind, the weather usually becomes colder; while when the barometer falls, owing to a change of wind, the weather usually becomes warmer.

If the barometer be high, (above 30.5,) and remain steady for some days, it is because there is, so to speak, a surplus of air at the place. The wind will be light, and the weather will probably be dry. A gale can set in only when the air flows away, and it will not at first be severe at the place. If the barometer be low (below 29.0 inches) and remain steady, there is a deficiency of air at the place. The wind will be light, also, but the weather will probably be cloudy and wet. However, there may be fine weather for a short time, what is called a "pet day," but there is great danger of a serious storm, because the air will try to force its way into the district where the readings are low, and increase the pressure there so as to restore the atmospherical equilibrium.

If the barometer rises slowly from a low level, the weather may become drier, and the wind lighter, or perhaps die away. There may also be local fogs.

If the barometer falls gradually from a high level, the weather may become wetter and more unpleasant, and there will never be a certainty of having a fine day, though there need not be much wind.

In general, whenever the level of the mercury continues steady, we may expect settled weather, but when it is unsteady we must look for a change, and perhaps a serious gale. A sudden rise of the barometer is very nearly as bad a sign as a sudden fall, because it shows that atmospherical equilibrium is unsteady. In an ordinary gale the wind often blows hardest when the barometer is just beginning to rise, directly after having been very low.

It must never be forgotten that it is impossible for any one to interpret the meaning of all the changes in his barometer, at first, or perhaps for a day or two, inasmuch as he requires to learn what is going on at stations in his neighborhood, for without this information he cannot know whether these changes are due to more local causes, or are the first symptoms of the approach of a more serious disturbance. A storm may be raging at a comparatively short distance from him, but his barometer, *taken by himself*, will not necessarily enable him to detect its existence.

However, in many cases, a good guess at what is likely to happen may be formed by an experienced observer who watches his instrument closely, records its indications on such a form as shown at Plate IV, and interprets them by the rules provided in this manual. He will, however, require to call to his aid not only observations of the temperature and dampness of the air, but all his experience as to the influence of the several seasons, the ordinary character of the water at the place, and the local signs of its change.

The daily weather reports issued by the meteorological office are calculated to render important service to any one who wishes to study weather; they contain observations made daily at 8 a. m., at twenty British and about as many foreign stations. Great care has been taken to insure the accuracy of these reports, and the result is that a great mass of information of very great value is published every day.

The table shows the readings of the barometer and dry and wet bulb thermometers, the direction and force of the wind, &c., and from it a very good idea may be gathered of the weather which is actually prevailing on or near our coast.

As regards the use which may be made of these reports, a most important principle has been discovered of late years.

Professor Buys Ballot, of Utrecht, and others have shown that we can tell with considerable certainty what wind may be expected to blow at any place if we know the readings of the barometer, taken a short time previously, at a number of stations situated within a distance of, say, one hundred or two hundred miles from that place.

The rule is: Stand with your left hand toward the place where the barometrical reading is lowest, and your right hand toward that where it is highest, and you will have your back to the direction of the wind which will blow during the day.

Thus the wind may be expected to be easterly when the pressure is highest in the north, lowest in the south.

Southerly, pressure highest in east, lowest in west.

Westerly, pressure highest in south, lowest in north.

Northerly, pressure highest in west, lowest in east.

The force of the wind on each day bears some proportion to the amount of difference in barometrical readings noticed between any two stations situated near the place where the wind was felt. Thus we find that it has been shown that a westerly gale hardly ever blows in the British Isles, unless, at least a few hours before, the pressure in the north of Scotland is half an inch less in amount than it is on the south coast of England.

We shall return to this subject when dealing with weather telegraphy. At present it is sufficient for us to say, with reference to the principles above laid down for the behavior of the instrument, that whenever a storm is blowing, the level of the barometer will be very different at stations near each other, so that as the storm travels across the country the barometer at any station will show signs of its coming and going by the mercury sinking or rising in the tube. This shows us why it is when the barometer is steady there is no great likelihood of a sudden change of weather, while when it is changing quickly, there is great danger of the wind freshening to a gale.

WEATHER TELEGRAPHY.

The facilities afforded us, by means of telegraphy, for comparing observations taken simultaneously at several stations, have revealed to us great differences, even between adjacent stations, as regards the instrumental readings, and the actual phenomena observed under various conditions of weather. In seeking to assign causes for these differences, we have been greatly assisted by applying the principle, to which allusion has already been made, under the name of Buys Ballot's law.

The immediate result of the law is to show that whenever barometrical readings are lower over any area than over those adjacent to it, the air will sweep round that area as a center, and the direction of its motion will be opposite to that of the hands of a watch; conversely, the air will sweep round an area of relatively high barometrical readings in the direction in which the hands of a watch move; the former of these motions is said to be *cyclonic*, the latter, *anti-cyclonic*. These words are derived from the word "cyclone," the general name for hurricanes and typhoons, in all which storms the motion of the air takes place around an area of diminished barometrical pressure.

We see, therefore, that the existence of a deficiency of atmospherical pressure, or what is termed a barometrical depression, over any district, is accompanied by cyclonical movement in the air in the neighboring districts.

The actual movement of the air has no reference, either in direction or velocity, to the absolute readings of the barometer at the point where it is lowest, or to the distance of the particles of air which are in motion from that point, but is related almost entirely to the distribution of pressure, in accordance with Buys Ballot's law. The law gives the direction of motion, and its truth for these islands, and the adjacent parts of the earth's surface, is incontestable; it appears, moreover, to hold good generally.

The velocity of the air depends, at least in a great measure, though not absolutely, on the difference of barometrical readings over a given distance, or on what is termed the barometrical "gradient."

The gradients adopted by the meteorological office are expressed in hundredths of an inch of mercury per fifty geographical miles.

To apply the same principles to the weather of the British Islands generally, it may safely be asserted that no storm of any serious extent is ever felt over the United Kingdom, unless there be an absolute difference in barometrical readings exceeding half an inch of mercury between two of our stations.*

The difference in readings between Rochefort and Aberdeen, on the 1st of February, 1868, when a tremendous westerly gale was blowing, was as much as 1.76 inches, the reading at Rochefort being 30.16, and that at Aberdeen 28.40. These figures give a gradient of 13.5 over the entire distance of six hundred and seventy-three miles, and we find that gales were reported from sixteen stations that morning. If these simultaneous barometrical readings for any considerable tract of country, such as that represented in the daily weather-reports,

* Local storms, which occasionally do great damage, may be felt when the barometrical disturbance is itself only local, and when the actual amount of difference between the extreme readings is less than half an inch although the gradients for a short distance may be high.

which embraces these islands and the adjacent coasts of the continent, be entered on a chart, a simple inspection of that chart is sufficient to show the direction and probable force of the winds felt over the entire district. Each of these elements will, however, be modified to a certain extent by the irregularities of the surface, for we can only feel the currents of the lowest stratum of the atmosphere, which are liable to be checked and deflected by mountains, and, in their passage over plains, to be seriously retarded even by the woods with which those plains are covered.

All the storms which we feel are accompanied by a considerable relative deduction of pressure, and these barometrical depressions travel over the country, carrying their own wind system with them. If, therefore, we could determine beforehand the direction of advance, and the rate of motion of each successive area of depression, as well as its shape, its gradients in each direction, and the rate of their increase or decrease in intensity, we should have made a considerable advance toward forecasting weather; of these several conditions, our knowledge is very incomplete. The attempts which have hitherto been made to lay down laws for any of these undetermined quantities, have met with a very limited amount of success. The *shape* of the area of depression is far from uniform, and is liable to modification—first, according to the character of the ground over which it passes; and, secondly, according to the conditions of pressure in the neighborhood.

The *direction of advance* takes place most usually from some point between southwest and northwest, but not unfrequently lies in a different direction, and it is stated that occasionally a motion even from the eastward has been recognized. The velocity of motion varies from five or six miles an hour, to as much as sixty or seventy; this latter rate of motion having been reached by the storm of December 16, 1869.

Owing to the extreme sensitiveness of the thermometer to changes of weather, it has been frequently proposed to consider its indications as fully equal in importance as those of the barometer; but great caution is necessary in acting on this idea. The accuracy of thermometrical observations depends on a great many conditions, such as aspect, exposure to the air, elevation above sea-level and above the surface of the ground, all of which are immaterial or can be allowed for in dealing with the barometer.

THE "POLAR-BANDS" AS STORM INDICATORS, BY DR. M. A. F. PRESTEL.

A. Von Humboldt is the first to have directed attention to the delicate uniformly broken groups of clouds (cirro-cumulus) and cloud striae, (cirro-stratus,) and to describe them under the name of polar-bands (bandes polair) because their perspective points of convergence (vanishing points) very frequently lie in the magnetic poles, so that the parallel series of little clouds and bands follow the magnetic meridian.

The rays of the aurora polaris show similar vanishing points, and not unfrequently one subsequently finds on the extinction of the polar lights the cirrus bands in the direction of these rays; this indication has called out most varied associations of ideas as well as words, since polarity, pole, pole of the winds, pole of the cold, &c., do not fail by many persons to excite the lively activity of the imagination.

The peculiarity of this enigmatical phenomenon, as A. Von Humboldt very appropriately specifies, is the variability, or at other times the regular change of the vanishing points. Ordinarily the bands are perfectly formed only in one direction, and as they move one sees them directed first from south to north, then gradually from east to west. They arise at times of great clearness of the sky. According to Humboldt, they are much more frequent under the tropics than in the temperate and cold zones. The observation that the original direction of the polar-bands from south to north gradually changes to that from east to west, applies also to the southern hemisphere.

Over Northwest Germany polar-bands extend from south to north or also from south-south-east to north-northwest, then change slowly into the position from south-southwest to north-northeast, and not unfrequently the vanishing points move still further to the east and west points. To the author of the *Cosmos* no relation seemed likely between the polar-bands and the upper currents of air. He says: "One cannot ascribe the progress (of these vanishing points) to the change in the current in the highest regions of the atmosphere."

When such polar-bands appear over Europe the telegraphic weather reports at present make it possible to compare the simultaneous condition of the atmosphere over the whole of Europe by this comparison, and have found that an area of storm, even if still far distant, is simultaneously present in all cases where decided polar-bands and their vanishing points in the horizon are shown. The polar-bands are present, then, on the extreme limits of the storm area and have a tangential direction to its limiting line. While the weather is still quiet and beautiful in the lower regions of the atmospheric ocean, the polar-bands already indicate the currents of air in the higher strata. The gradual change to eastward of the vanishing points of the bands pointing north and south, is the consequence of the progress of the center of the storm. When the latter moves from the west over the Atlantic ocean (toward Holland) the polar-bands have the direction from south to north at the first approach of the storm area; if the center of the storm and the bands themselves advance toward the northeast, then also the apparent direction of the latter alters in a corresponding manner, and since they are at right angles to a line drawn toward the storm center, they show to the observer the direction in which such a storm area lies, though in many cases five hundred to a thousand miles distant,

as well as that in which it progresses. If the storm area does not pass to one side of the observer, but the center approaches him more or less directly, then always twenty-four to thirty-six hours elapse before the arrival of the storm. The storms thus announce themselves telegraphically by means of the polar-bands. The remaining uncertainty with respect to their paths which may still prevail is removed in the customary manner by the barometric observations with the fine cirrus filaments when these appear isolated. The polar-bands form on the celestial hemisphere a configuration similar to that of the marks and stripes on the surface of a melon, and they always converge toward two opposite points in the horizon.—From "*Der Sturmwarner*," Emden, 1870.

TABLES.

The explanation of the accompanying tables is as follows:

Tables No. I and No. II are used for finding the moisture or relative humidity of the atmosphere at any station, when simply the indications of the hygrometer are to be had.

The hygrometer in use by the signal office is the wet and dry bulb thermometer.* Having noticed the height of the mercury in each of these two thermometers, the observer enters the table with the difference of the two readings (on the horizontal line at the top) and with the temperature of the wet-bulb thermometer, (denoted by t' .) Let him, then, seek first the column at the head of which stands the difference of the thermometers; then go down as far as the horizontal line, at the beginning of which stands the temperature of the wet-bulb thermometer; and the figures he finds on that line will express the relative humidity, for which he is searching.

When the temperature in both thermometers is the same and the difference 0° , evaporation from the moist muslin on the wet-bulb has entirely ceased, the quicksilver in its tube has ceased to fall, and, of course, the relative humidity is that of full saturation or 100, as is shown by the second vertical column in table No. I.

*The best form of hygrometer consists of two mercurial thermometers, which, placed side by side, indicate the same temperature. When fixed together on a frame they are called the *wet and dry bulb thermometers*. The dry-bulb is a common thermometer, intended to show the temperature of the air. The wet-bulb is also a common thermometer, having its bulb covered with a piece of muslin, from which pass a few threads of darning cotton into a small vessel containing rain-water. The water rises by capillary attraction, thus keeping the muslin constantly wet. When the air is dry, evaporation goes on rapidly from the muslin, and on account of the heat lost by evaporation, the wet-bulb indicates a lower temperature than the dry-bulb. But when the air is damp, evaporation is slower, and the difference between the two thermometers becomes smaller. When the air is completely saturated with moisture, evaporation ceases entirely, and the two thermometers show the same temperature. The instrument is shown in the following cut:

THE WET AND DRY BULB THERMOMETER.

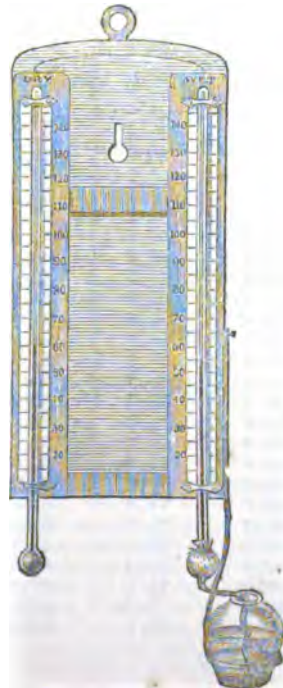


Table No. I is used but seldom, because it is adapted for extreme temperatures below the freezing point of fresh water, (32° Fahrenheit.) It gives the relative humidity in the vertical columns for differences of half degree between the two thermometers and when the wet-bulb falls as low down as 0°. Whenever the wet-bulb stands at any figure between 0° and 9° above 0° (inclusive) use lower part of table No. I. In other cases, table No. II.

These tables are compiled from "Guyot's Meteorological and Physical Tables, prepared for the Smithsonian Institution."

No. 1.—BELOW FREEZING-POINT; BULB COVERED WITH A FILM OF ICE.

Temperature Fahrenheit.—Relative humidity in hundredths.

Wet-bulb thermometer t° Fahrenheit.	0°.0	0°.5	1°.0	1°.5	2°.0	2°.5
	Relative humidity.	Relative humidity.	Relative humidity.	Relative humidity.	Relative humidity.	Relative humidity.
—31	100	36.0				
—30	100	39.6				
—29	100	42.9				
—28	100	46.1				
—27	100	49.0				
—26	100	51.8				
—25	100	54.4				
—24	100	56.8				
—23	100	59.0				
—22	100	61.0				
—21	100	62.6	26.9			
—20	100	64.2	30.3			
—19	100	65.9	33.5			
—18	100	67.5	36.6			
—17	100	69.0	39.5			
—16	100	70.4	42.3			
—15	100	71.8	44.9	19.4		
—14	100	73.0	47.4	23.0		
—13	100	74.3	49.8	26.4		
—12	100	75.4	51.9	29.5		
—11	100	76.5	53.9	32.5		
—10	100	77.5	55.7	35.3	15.6	
—9	100	78.5	55.7	38.3	19.1	
—8	100	79.4	59.4	40.6	22.5	
—7	100	80.3	61.1	43.0	25.7	
—6	100	81.1	62.7	45.4	28.4	12.9
—5	100	81.8	64.5	47.6	31.7	16.4
—4	100	82.5	65.8	49.8	34.5	19.8
—3	100	83.2	67.1	51.7	36.9	22.8
—2	100	83.9	68.3	53.5	39.3	25.8
—1	100	84.5	69.5	55.3	41.6	28.6
0	100	85.0	71.0	57.0	43.8	31.3
1	100	85.0	70.7	57.0	43.8	31.3
2	100	85.6	71.8	58.6	46.0	33.9
3	100	86.2	73.0	60.2	48.0	36.4
4	100	86.7	74.0	61.8	50.0	38.8
5	100	87.2	75.0	63.3	52.0	41.2
6	100	87.7	76.0	64.7	53.8	43.4
7	100	88.2	76.9	66.0	55.3	45.2
8	100	88.6	77.7	67.1	56.8	47.0
9	100	89.0	78.4	68.2	58.2	48.8
9	100	89.4	79.1	69.2	59.6	50.5



No. 2.—RELATIVE HUMIDITY.

Difference between wet and dry-bulb thermometers.

	1°	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
WET-BULB THERMOMETER.																									
10	79	61	44	28	13																				
15	83	67	52	39	27	15	5																		
20	85	72	60	48	38	28	19	11																	
25	88	77	67	59	48	41	32	26	18	10															
30	90	79	69	61	52	45	37	30	26	18	11	6													
35	90	80	71	63	56	48	42	35	30	24	19	14	10	6											
40	91	83	75	67	60	54	48	42	37	32	27	23	19	14	12										
45	92	85	77	71	64	59	53	48	43	38	34	30	26	23	19	16	13	10							
50	93	86	79	73	68	62	57	53	48	44	40	36	33	29	26	23	20	18	15	13	11				
55	93	87	81	76	70	66	61	57	52	48	45	41	38	35	32	29	26	24	20	19	17	15	13	11	9
60	94	88	83	78	73	68	64	60	56	52	49	45	42	39	36	34	31	29	26	24	22	20	18	17	15
65	94	90	84	79	75	71	67	63	59	56	52	49	46	43	40	38	35	33	31	29	27	25	23	21	20
70	95	90	85	81	76	72	69	65	61	58	55	52	49	46	44	41	40	37	35	32	31	29	27	26	24
75	95	90	86	82	78	74	70	67	64	61	58	55	52	49	47	45	42	40	38	36	34	32	30	29	27
80	95	91	87	83	79	75	72	69	66	63	60	57	54	52	49	47	45	43	41	39	37	35	34	32	30
85	96	91	88	84	80	76	73	70	67	64	62	59	56	54	52	50	47	45	43	41	40	38	36	35	33
90	96	92	88	85	81	78	75	72	69	66	63	61	58	56	54	52	49	47	46	44	42	40	39	37	36
95	96	92	89	85	82	79	76	73	70	68	65	62	60	58	56	53	51	49	48	46	44	42	41	39	38
100	96	93	89	86	83	80	77	74	71	69	66	64	62	59	57	55	53	51	50	48	46	44	43	41	40

PAPER 7.

THE CAUTIONARY SIGNAL.

[Circular.]

WAR DEPARTMENT, OFFICE OF CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE,
Washington, D. C., October 25, 1871.

The cautionary signal of the signal service, United States Army—a red flag with black square in the center by day, and a red light by night—displayed at the office of the observer, and other prominent places throughout any city, signifies:

1. That, from the information had at the central office in Washington, a probability of stormy or dangerous weather has been deduced for the port or place at which the cautionary signal is displayed, or in that vicinity.

2. That the danger appears to be so great as to demand precaution on the part of navigators and others interested—such as an examination of vessels or other structures to be endangered by a storm—the inspection of crews, rigging, &c., and general preparation for rough weather.

3. It calls for frequent examination of local barometers, and other instruments, by ship-captains, or others interested, and the study of local signs of the weather, as clouds, &c. By these means those who are expert may often be confirmed as to the need of the precaution to which the cautionary signal calls attention, or may determine that the danger is overestimated or past.

ALBERT J. MYER,
Brigadier General and Chief Signal Officer, U. S. A

THE CAUTIONARY SIGNAL.

This red flag or red light (the cautionary signal) is displayed when the information in possession of the office leads to the belief that dangerous winds are approaching.

The term dangerous winds has ordinarily a somewhat different meaning, according to the location of the station. Thus the severe gales of the Atlantic (where the hourly velocity of the wind ranges from forty to seventy miles) are comparatively very rare on the lakes, where the limited sea-room causes winds that on the neighboring shores are registered only as brisk (i. e., fifteen to twenty-five miles) to become dangerous. Again, the direction in which the wind is blowing is a most important consideration, and as general experience

shows that most danger is apprehended from wind blowing on to a lee shore, the cautionary signal may very properly be expected to be hoisted only in case such winds are apprehended for the port in question.

For inland and well-sheltered points, however, as Baltimore and Philadelphia, this distinction cannot be easily made, and in order to avoid the confusion that might very possibly arise from the display of different signals at adjacent ports, such as Milwaukee and Grand Haven, Detroit and Toledo, &c., it has been decided for the present, at least, not to put into practice the above suggestion. The cautionary signal will therefore be hoisted whenever the winds are expected to be as strong as twenty-five miles an hour, and to continue so for several hours within a radius of one hundred miles of the station. It will thus be left to the public individually to decide whether that wind will be dangerous to any special occupation. It is hoped that eventually it will be practicable to add a second signal giving warning of severe gales. Each signal holds good for the space of about eight hours from the time at which it is hoisted. When no signal is displayed it indicates that the office has no knowledge of any approaching danger, and as this is not only the case when there is really no danger, but also in many cases may be the consequence of the failure of the telegraphic connection of the central office at Washington with neighboring stations, it should not lead the mariner to be less watchful of the weather, nor to neglect to obtain such weather intelligence as he can from the telegraphic reports at the observer's office. If the mariner desires more exact information as to the nature of the threatening danger, he should obtain the latest "weather-bulletin," or "weather-map," published by the office, as well as the general "synopses and probabilities," or the so-called "press-reports." These can generally be had at the office of the observer.

If he finds that high winds are prevailing within two hundred miles of the port at which he is, he should consider what the disturbing cause is that produces these winds. This may in general be stated to be an excess of barometric pressure over some district and a deficiency over some neighboring region.

If the region of low barometer be very small, the area of violent winds will be correspondingly contracted, as in tornadoes on land. Even if no fall in the barometer be noticed, brisk winds may be experienced, owing to the fact that the air in rapid motion overhead may drag along with it that on the surface of the ground, but in general it may be stated that ninety per cent. of the winds that are dangerous to navigators are accompanied by areas of notably high and low barometer. Now, when the barometer falls over any region the inertia of the surrounding air causes some time to elapse before it is set in motion, and similarly a large mass of air moving with rapidity preserves its motion after the exciting cause is removed. Thus it may happen that strong winds exist in regions at which no barometric disturbance exists at the moment, but has existed a short time previously.

Again, the space inclosing the partial vacuum, into which the wind tends to rush, itself moves slowly over the earth, and thus the wind at any point appears still longer to delay to follow the barometric disturbance. This delay will, of course, vary with the motion of the central area of low pressure, or that of the neighboring high pressure.

The general consequences of the preceding considerations are that the area covered by the weather-chart presents to our view one, two, or three regions of low pressure, and one or two of high, and that between these, but much nearer to the low than the high barometer, we find the strongest winds. As regards the direction of the winds, they may be described as not tending directly to the center of the area of low pressure, but as circulating around and in upon it in a sinuous spiral, in a direction contrary to the movements of the hands of a watch, (when it is laid down with its face upward;) thus there are found northerly winds on the west side of the region, westerly ones on the south side, and so around. Of these winds those from the northwest and southwest are more violent, on the average, than those from the southeast and northeast, but the latter may be more dangerous, and, when they pass over smoother ground, may be even stronger at the immediate surface of the earth.

The general tri-daily press report (to be had at observers' offices) contains always a statement of the positions and movements of the larger areas of high and low barometer, of cold and warm weather, or of stormy, cloudy, and clear weather. In the absence of a weather-map, therefore, one can determine in a general way whether these are approaching to or departing from his neighborhood; and this knowledge leads to the following conclusions:

1. If the barometer is very low at the center, very severe gales may be expected over a large area, say within a circle of two hundred miles radius, from October to April, but within a smaller circle, less than one hundred miles, from May to September.

2. Areas of low barometer, when first perceived in Minnesota, may be expected to move eastward in the summer months, with westerly winds on Lake Superior, and to move to the southeast and east-southeast in the fall, with east and northeast winds on Superior and Michigan.

3. When perceived in Nebraska or Indian Territory, they may be expected to move north-east to Lake Ontario, with northeast winds on Superior, Michigan, and Huron.

4. When perceived in Texas, or anywhere on the Gulf coast, they may be expected to move northward to the latitude of 35° or 40° , and there begin to move northeastward, with northeast, north, and northwest winds on the lakes, and subsequently southerly winds on the Middle and East Atlantic coasts.

5. When perceived on the coast of Florida, or off the South Atlantic, they, in the fall, winter, and spring, may be expected to move slowly up the coast, preceded by northeasterly winds and rain.

6. While the preceding sentences mark out the most general average phenomena attending the movement of the disturbing areas of low pressure, it must be borne in mind that but very rarely will the ever-varying atmospheric condition allow any storm to pursue a uniform average course over the earth.

7. The most important condition disturbing the regular movement of a storm is the presence of moist air; that is to say, air nearly saturated with aqueous vapor. Such air is found over extensive forests and marshes, over bodies of warm water, and especially over a field of snow or ice which is being melted by the sun. Toward these regions the areas of low barometer may be expected to be drawn more or less strongly, or at least to spread out over them.

8. When the low barometer on the west of the Appalachian chain of mountains causes easterly winds on the Atlantic coast, these force a mass of air up the western slopes of these hills, and this, as it rises, becomes more and more nearly saturated, so that the low pressure west of the mountains may be expected to be rapidly spread over the range and even transferred, as it were, to the Atlantic coast.

9. Waves of low pressure on the Pacific coast are also transferred across the Rocky Mountains and the elevated plateaus, and may be expected, when they arrive at the Mississippi Valley, to produce cloud and probably storm centers.

10. Besides the disturbing attractions of moist area, we have to consider the contrary influences exerted by areas of dry air, such as are found on the eastern slope of the Rocky Mountains. Where a storm-center is driven into such a region, clouds and weaker winds may be expected, and the storm will gradually die out, unless moist air lies beyond.

11. Besides the forces attracting the areas of low pressure, we have also to consider the pressure of an area of high barometer; this, by causing a system of decidedly strong wind to circulate around in it the anti-cyclonic direction, may drive the storm-center (whether it be a small tornado, or an extensive cyclone) before it, so as to undergo quite a change in its path.

12. The general path pursued day after day by a storm-center is indeed the resultant of a system of pressures, some of which arise from the pressures of areas of high and low barometer, some from areas of moist or heated air, some from winds, and others from the rotation of the earth on its axis; these are the important controlling influences; such others as may arise from lunar tides in the air, &c., &c., are considered at present as of inferior prominence.

13. Whether the observer determines the probable movement of a given storm-center, by means of these general considerations, or not, he cannot safely neglect the indications of his own barometer. The experience of the past fifty years has borne uniform testimony to the pre-eminent value of the indications of this instrument, taken in conjunction, of course, with the wind and weather.

14. If it be known that a center of low pressure is in the neighborhood of the observer, and he stand facing it, he will find the wind blowing from some point on his left, toward some point on his right; and vice versa, if he stand with his left hand toward the direction from which the wind comes, he will face the region of lowest pressure. It is better to use, not the direction of the local wind, but that from which the *low* clouds are moving; the *very high* clouds should not be used.

15. If while facing the low pressure he finds the wind steady and his barometer falling, then the central area is advancing directly toward him, and so long as this continues he may expect the wind to increase until the barometer reaches its lowest; then a lull will take place followed by strong winds from the opposite quarter, which will continue while the barometer is rapidly rising, but subside as it rises more slowly. The strength of the wind may be expected to be in general proportioned to the rapidity of the fall or rise of the barometer.

16. The storm-center has been spoken of as being in front of the observer. It will, however, in general be somewhat more to his right as he stands with his left to the wind.

17. If the wind *veer*, (that is to say, gradually change its direction, for instance, from southeast to southwest, or in that order around the compass,) the storm-center is passing by on the north side of the observer; if it *backs*, (changing, for instance, from southwest to southeast,) the center of lowest pressure is passing by on the south side, and the distance at which it is may be roughly estimated by the rapidity of the fall in barometer.

18. The severest winds are those, as before stated, on the south and west side of the center, those on the east side are more frequently squally.

19. In the foregoing the observer has been supposed to be stationary; should he be in motion, however, this will affect especially his observation of the barometer, since he may easily run into or away from an area of low pressure, and he himself must mentally allow for the influence of his motion.

20. In comparing the readings of his own barometer with those published on the bulletin and map of this office, the mariner will find that the latter have all been reduced to a uniform sea-level and to a uniform temperature. He, therefore, will find it most convenient to bear in mind the amount of these corrections and to mentally apply them to his own barometer.

Should he preserve his records and transmit them to this office, however, the original uncorrected observations only are desired. The following tables show the general amount of these corrections.

21. An allowance for the temperature of the barometer is made by noting the thermometer attached to that instrument.

For a temperature of 20° Fahrenheit add	0.02 inch.
For a temperature of 30° Fahrenheit add	0.00 inch.
For a temperature of 40° Fahrenheit subtract	0.03 inch.
For a temperature of 50° Fahrenheit subtract	0.06 inch.
For a temperature of 60° Fahrenheit subtract	0.08 inch.
For a temperature of 70° Fahrenheit subtract	0.11 inch.
For a temperature of 80° Fahrenheit subtract	0.13 inch.
For a temperature of 90° Fahrenheit subtract	0.16 inch.
For a temperature of 100° Fahrenheit subtract	0.18 inch.

These numbers are applicable to barometers having brass scales, which are the most reliable ones; aneroid barometers ought not to require any temperature correction.

The correction for altitude above the sea will vary with the annual temperature, but may be approximately made as follows:

	Altitude of water.	Altitude of barometer.	Add to ba- rometer.
	Feet.	Feet.	Inch.
For the ocean	0	25	0.02
For Lake Champlain	95	120	0.14
For Lake Ontario	235	260	0.29
For Lake Erie	564	590	0.66
For Lake St. Clair	570	595	0.66
For Lake Huron	574	600	0.66
For Lake Michigan	584	600	0.66
For Lake Superior	600	625	0.69
For the Ohio at Pittsburgh	725	750	0.80
For the Ohio at Cincinnati	450	475	0.50
For the Ohio at Louisville	400	425	0.47
For the Ohio at Cairo	300	325	0.34
For the Missouri at Omaha	950	975	1.05
For the Mississippi at St. Paul	650	675	0.74
For the Mississippi at St. Louis	425	450	0.48
For the Mississippi at Vicksburgh	130	155	0.17
For the Mississippi at New Orleans	20	50	0.05

PLACING AND READING OF THE INSTRUMENTS.

NOTE.—The following instructions apply to Green's, Fortin's, and other barometers constructed on the Fortin principle, and Robinson's anemometer, (Green's model.)

BAROMETER.

The barometer must be kept in a room of as uniform temperature as practicable; and to protect the instrument from such external influences as would produce irregularities it should be kept in a box. The box will be firmly attached against the wall in a vertical position, in such a way that the cover when open will be in a direction parallel to a window.

An opening, large enough to admit the tube of the instrument, will be cut in the upper end of the box, and directly above this a strong hook, of such length as to extend two or three inches beyond the box, will be driven into the wall.

The instrument will be suspended on the hook, and when not in use will be kept in the closed box.

When an observation is to be made, the barometer will be slipped out on the hook into the full light of the window.

It is always well to follow a system in every mechanical operation, and particularly in taking observations, as it insures an accuracy that cannot otherwise be obtained. The following rules are therefore presented:

1st. Tap the instrument a little above the cistern, to destroy the adhesion of the metal to the glass.

2d. Read the attached thermometer, which is very sensitive.

3d. By means of the adjusting-screw bring the surface of the mercury in the cistern in contact with the ivory point which denotes its constant level. If correctly done neither a line of light can be seen between the point and the surface of the mercury, nor will there appear on the surface of the mercury a dimple caused by capillary action.

4th. Again tap the instrument just above the cistern.

5th. Take hold of the instrument above the thermometer, with the left hand, and by means of the vernier-screw bring the back and front lines of the vernier into the same horizontal plane with the top of the mercury in the tube, just touching it and no more. Remove the hand, and as soon as the barometer is vertical, note whether any line of light appears between the summit and the edge of the ring. When correctly adjusted a small portion is obscured, while the light is seen on both sides.

6th. Read the barometer at leisure.

On the barometer-tube is a fixed scale, divided into inches and tenths of inches. There is also a vernier, or sliding scale, which reads to hundredths of an inch.

First read the point marked on the fixed scale, by the bottom of the vernier, which will give the inches and tenths of inches; set this down and then refer to the vernier for the hundredths.

The vernier is divided into ten equal parts, numbered from 1 to 10. Commencing at the bottom, examine the lines until one is found exactly coinciding with *any* line on the fixed scale; the number of such line on the vernier gives you the hundredths; i. e., if the eighth line on the vernier coincides exactly with any line of the fixed scale, the reading is 0.8 inch. In case no line of the vernier exactly coincides with a line on the fixed scale, two lines of the vernier must somewhere be embraced in the space indicated by two successive lines on the fixed scale, and observing where this occurs, read for hundredths the vernier line which most nearly coincides with one of them. In case the coinciding line is 10, which only happens when the zero also coincides, there are no hundredths, and zero must be placed for the hundredths.

The barometrical readings must be reduced for temperature and elevation.

Tables for such corrections can be found in Williamson "On the use of the barometer," and in "Guyot's Tables," Tables XVII and XIX.

This information may also be obtained by application to the observer-sergeant in charge of the station nearest to the applicant.

THE THERMOMETER.

Place the thermometer in the open air, so situated that it will be always in the shade, and have a free circulation of air around it.

The thermometer should be at least from nine to twelve inches from any neighboring object, and should be protected against its own radiation to the sky and earth, and from the heat reflected by neighboring objects.

These conditions can be fulfilled by the construction of an instrument-shelter, which should be constructed outside of a window of a room not heated, and which, corresponding in size to the window, should project about two feet from the panes. Two lattice-blinds should form the exterior of the shelter, one of which should always be closed, as a shelter to the instruments, and the other, except in violent storms, should be open, in order to admit air and light.

A foot from the panes, and at the height of the observer's eye when in the room, two parallel transverse wooden bars, about an inch wide, should be fastened; the thermometer should be fastened exactly perpendicularly to the bars, so that its top is secured by a screw to the upper bar, while its bulb projects a few inches below the lower bar, to which the instrument is secured by a clasp or screw.

The bulb should be so placed that it will not rest against a wooden or metal back, but be free from both scale and back.

READING.

In reading, it is very important that the observer's eye should be exactly at the same height as the top of the column of mercury, otherwise an erroneous reading will be made.

The reading should always be made through the panes, to avoid the influence of the temperature of the chamber on the thermometer, and a second one should be made shortly after, to verify the first. When the bulb becomes moistened by rain or fog, or is covered by ice or snow, it should be carefully wiped, and the reading should not be made until the instrument has acquired the temperature of air.

VERIFICATION.

The zero point should be verified at the beginning and end of winter. To do this, immerse the bulb in a vessel filled with snow or pounded ice, and press slightly a layer of several inches around it, so that the stem, which should be exactly perpendicular, is covered

with snow as high as the freezing point on the scale. Do this in a room the temperature of which is above freezing point, as that point indicates the temperature of *melting* snow.

After about half an hour, read it, taking the utmost care to have the eye exactly at the same height as the top of the mercury.

In case the summit of the mercury and the freezing point of the scale do not agree, note the difference. Some instruments are so constructed as to admit of loosening the screws, and sliding the glass tube containing the mercury up or down a distance equivalent to the error; but it is not advisable to make frequent mechanical changes of this kind. The correction should be applied to each reading.

SELF-REGISTERING THERMOMETERS.

The two thermometers—maximum and minimum—are to be placed beside the common thermometer, with their bulbs opposite and free, attached horizontally to two perpendicular wooden bars, uniting the parallel bars running across the shelter.

In reading them, the same care must be used as with the common thermometer, the eye being in a perpendicular line with the extremity of the index; after verifying the first reading by a second, bring the index of each to the summit of its column by the use of a magnet, in order to set them for the next day's record.

VERIFICATION.

Compare the two thermometers frequently with the common thermometer, and verify the zero several times each year, in the same manner as stated for the common thermometer and enter the error in the register, to be applied at each reading.

HYGROMETER.

These thermometers, one with a dry and one with a wet bulb, must be placed on the same parallel bars as the common thermometer, and several inches apart. The bulbs should be free, and at a distance from the bars. In case of a violent wind, the instrument may be protected by the closing of the movable blind, which may also be used as a fan, to cause evaporation when the air is too still.

The cloth covering the bulb must be linen, and of medium texture, and must be changed every month, and the bulb cleaned. It can be washed without removing, by means of a syringe. It may be kept continually wet, or be moistened a short time before taking the observation, and experience has shown that the average result is the same in both cases. Filtered rain-water must be used.

VERIFICATION.

The two thermometers must be frequently compared, and if they are not adjusted so as to correct any difference which may exist, the error must be registered and taken into account after making an observation.

THE ANEMOMETER.

The anemometer should be carefully fixed, in a vertical position, upon a post of sufficient height to bring the dial on a level with the eye of the observer, and in an exposed condition, so as to receive the full force of the wind. The post must be firmly enough planted to prevent the instrument from vibrating.

To obtain the velocity of the wind at any time, two observations, at an interval of five minutes, must be made on the *outer dial only*, and the difference between the readings, which will be obtained in miles and tenths of miles, multiplied by 12, gives the velocity per hour. Example: Suppose the outer index to be at 3 the first reading, and at 3.6 the second; the difference is 0.6, which, multiplied by 12, gives 7.2 miles as the velocity per hour. Great care should be exercised to make these observations exactly five minutes apart.

Reading: Each line on the inner dial indicates 10 miles, and the dial reads by tens from ten to one thousand. Each line on the outer dial indicates a tenth of a mile, and the dial reads, by tenths and by miles, from one-tenth of a mile to ten miles. The zero line of the outer dial is the point at which the inner dial must be read. Read on the inner dial the line exactly coinciding with the *zero line of the outer dial*, or if no line exactly coincides, then read the line next less than it.

No line of the inner dial can exactly coincide with the zero of the outer dial, unless the zero exactly coincides with the steel index at the top of the dials, except when the instrument is improperly adjusted.

When such coincidence does not take place, the outer dial must be read at the point exactly coinciding with the steel index, and the distance there indicated, which is noted on the outer dial in miles and tenths of miles, must be added to the result obtained from the inner dial.

RAIN-GAUGE.

The rain-gauge should be placed with the top of the collector twelve inches above the surface of the ground, and be firmly fixed in a vertical position. It should be examined each morning at the usual time of observation, and its contents carefully measured by a graduated rod, which is furnished with the gauge. Snow should be melted, and measured as rain. The gauge should be emptied for each observation.

PAPER 8.

[Working forms of circuit.]

Circuit No. 1.—WASHINGTON AND NEW YORK.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SPECIAL CIRCUIT.

To be made up daily at $\left\{ \begin{array}{l} 7.45 \text{ a. m.} \\ 4.45 \text{ p. m.} \\ 11.45 \text{ p. m.} \end{array} \right\}$ Washington time.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 9.

[Working forms of circuit.]

Circuit No. 2.—WASHINGTON AND NEW ORLEANS.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SPECIAL CIRCUIT.

To be made up daily at $\left\{ \begin{array}{l} 7.45 \text{ a. m.} \\ 4.45 \text{ p. m.} \\ 11.45 \text{ p. m.} \end{array} \right\}$ Washington time.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 10.

[Working forms of circuit.]

CIRCUIT No. 3.—WASHINGTON AND CHICAGO.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SPECIAL CIRCUIT.

To be made up daily at $\left\{ \begin{array}{l} 7.45 \text{ a. m.} \\ 4.45 \text{ p. m.} \\ 11.45 \text{ p. m.} \end{array} \right\}$ Washington time.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 11.

[Working forms of circuit.]

CIRCUIT No. 4.—PORTLAND, MAINE, AND NEW YORK.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

PORTLAND TO NEW YORK.

NEW YORK TO PORTLAND.

At 8.31 a. m., 5.31 p. m.,
and 12.31 a. m., Port-
land will send re-
ports from—

Portland.
Montreal.

Through—
Boston,
New London.
To—
New York.

At 8.25 a. m., 5.25 p. m.,
and 12.25 a. m., Bos-
ton will send reports
from—

Boston,
Burlington,
Mount Washington,
Through—
New London,
To—
New York.

At 8.19 a. m., 5.19 p. m.,
and 12.19 a. m., New
London will send—

To—
New York.

At 8.17 a. m., 5.17 p. m.,
and 12.17 a. m., New
York will send re-
ports from—

All other stations, ex-
cept Punta Rasa,

To—
Portland.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 12.

[Working forms of circuit.]

CIRCUIT No. 5.—BOSTON AND MOUNT WASHINGTON.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

MT. WASHINGTON TO BOSTON.	BOSTON TO MT. WASHINGTON.
At 8.22 a. m., 5.22 p. m., and 12.22 a. m., Mt. Washington will send to—	
Boston.	

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 13.

[Working forms of circuit.]

CIRCUIT No. 6.—BOSTON AND BURLINGTON.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

BURLINGTON TO BOSTON.	BOSTON TO BURLINGTON.
At 8.15 a. m., 5.15 p. m., and 12.15 a. m., Burlington will send to—	At 8.34 a. m., 5.34 p. m., and 12.34 a. m., Boston will send reports from—
Boston.	Boston, New York, Portland, Me., Buffalo, Oswego, To— Burlington.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

REPORT OF THE SECRETARY OF WAR.

PAPER 14.

[Working forms of circuit.]

CIRCUIT No. 7.—WASHINGTON AND KNOXVILLE.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

KNOXVILLE TO WASHINGTON.		WASHINGTON TO KNOXVILLE.
At 7.32 a. m., 4.32 p. m., and 11.32 p. m., Knoxville will send, through—		At 7.35 a. m., 4.53 p. m., and 11.53 p. m., Lynchburgh will send—
Lynchburgh, To— Washington.		To— Washington.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 15.

[Working forms of circuit.]

CIRCUIT No. 8—NEW YORK AND LAKE CITY.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

LAKE CITY TO NEW YORK.					NEW YORK TO LAKE CITY.				
At 7:29 a. m., Lake City will send reports from—	At 7:36 a. m., Augusta will send reports—	At 7:47 a. m., Charleston will send reports—	At 7:56 a. m., Wilmington will send reports—	At 8:04 a. m., Norfolk will send reports—	At 8:02 a. m., Washington will send reports from—	At 8:08 a. m., Baltimore will send reports—	At 8:14 a. m., Philadelphia will send reports—	At 8:16 a. m., Cape May will send reports—	At 8:22 a. m., New York will send reports from—
Through— Savannah, Augusta, Charleston, Wilmington, Norfolk, Washington, Baltimore, Philadelphia, Cape May.	Through— Charleston, Wilmington, Norfolk, Washington, Baltimore, Philadelphia, Cape May.	Through— Wilmington, Norfolk, Washington, Baltimore, Philadelphia, Cape May.	Through— Norfolk, Washington, Baltimore, Philadelphia, Cape May.	Through— Washington, Baltimore, Philadelphia, Cape May.	Through— Washington, Baltimore, Philadelphia, Cape May.	Through— Philadelphia, Cape May.	Through— Philadelphia, Cape May.	Through— Philadelphia, Cape May.	All other stations
To— New York.	To— New York.	To— New York.	To— New York.	To— New York.	To— New York.	To— New York.	To— New York.	To— New York.	To— Lake City.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that, when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words; the afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 16.

CIRCUIT No. 9—LAKE CITY AND KEY WEST.

[Working forms of circuit.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

KEY WEST TO LAKE CITY.		LAKE CITY TO KEY WEST.
At 7.31 a.m., 4.31 p.m., and 11.31 p. m., Key West will send—	At 7.31 a. m., 4.31 p. m., and 11.31 p. m., Punta Rassa will send—	At 7.37 a. m., 4.37 p. m., and 11.37 p. m., Lake City will send reports from—
<i>To—</i> Lake City.	<i>To—</i> Lake City.	Savannah, Charleston, Wilmington, Norfolk, Mobile, New Orleans, New York, Jacksonville, <i>To—</i> Key West.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words; the afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 17.

[Working forms of circuit.]

CIRCUIT No. 9 A.—LAKE CITY AND JACKSONVILLE.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

JACKSONVILLE TO LAKE CITY.	LAKE CITY TO JACKSONVILLE.
At 7.32 a. m., 4.32 p. m., 11.32 p. m., Jacksonville will send—	At 7.37 a. m., 4.37 p. m., 11.37 p. m., Lake City will send reports from—
<i>To—</i> Lake City.	Lake City, Key West, Punta Rassa, Savannah, Charleston, Wilmington, Norfolk, Mobile, New Orleans, <i>To—</i> Jacksonville.

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 18.

[Working form of circuit.]

CIRCUIT No. 10.—AUGUSTA AND NEW ORLEANS.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

AUGUSTA TO NEW ORLEANS.		NEW ORLEANS TO AUGUSTA.	
At 7.40 a. m., 4.40 p. m., 11.40 p. m., Augusta will send reports from—	At 7.22 a. m., 4.22 p. m., 11.22 p. m., Mobile will send—	At 7.15 a. m., 4.15 p. m., 11.15 p. m., New Or- leans will send reports from—	
Key West, Savannah, Augusta, Charleston, Wilmington, Norfolk, Punta Raasa, Jacksonville, Through— Mobile, To— New Orleans.	To— New Orleans.	New Orleans, Galveston, Shroveport, To— Augusta.	

NOTES.

- Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
- Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
- The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
- The time given for sending reports is the local time of that particular station.

PAPER 19.

[Working forms of circuit.]

Circuit No. 12.—NEW YORK AND MILWAUKEE.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

MILWAUKEE TO NEW YORK.		NEW YORK TO MILWAUKEE.	
At 7:25 a. m., and 11:45 p. m., Milwaukee reports from—	At 7:33 a. m., 4:23 p. m., and 11:33 p. m., Chicago will send reports from—	At 7:43 a. m., 4:43 p. m., and 11:43 p. m., Detroit will send reports from—	At 7:40 a. m., 4:40 p. m., and 11:40 p. m., Toledo will send—
Milwaukee, St. Paul, Duluth, Escanaba, Marquette, Through—Chicago, Detroit, Toledo, Cincinnati, Buffalo, Rochester, Oswego,	Chicago, Davenport, Omaha, Cleyenne, Corinne, San Francisco, St. Louis, Leavenworth, Cairo, Indianapolis, Memphis, Jacksonville, Vicksburg, Louisville, Through—Milwaukee, Detroit, Toledo, Cincinnati, New York.	Detroit, Grand Haven.	Through—Cincinnati, Buffalo, Rochester, Oswego, To—New York.
		At 7:43 a. m., 4:43 p. m., and 11:43 p. m., Detroit will send reports from—	Through—Cincinnati, Buffalo, Rochester, Oswego, To—New York.
		At 7:40 a. m., 4:40 p. m., and 11:40 p. m., Toledo will send—	Through—Cincinnati, Buffalo, Rochester, Oswego, To—New York.
		At 7:34 a. m., 4:34 p. m., and 11:34 p. m., Cincinnati will send—	Through—Cincinnati, Buffalo, Rochester, Oswego, To—New York.
		At 7:45 a. m., 4:45 p. m., and 11:45 p. m., Cleveland will send—	Through—Buffalo, Rochester, Oswego, To—New York.
		At 7:54 a. m., 4:54 p. m., and 11:54 p. m., Buffalo will send—	Through—Rochester, Oswego, To—New York.
		At 7:59 a. m., 4:57 p. m., and 11:57 p. m., Rochester will send—	Through—Oswego, To—New York.
		At 8:02 a. m., 5:02 p. m., and 12:03 a. m., Oswego will send—	To—Milwaukee.
		At 8:52 a. m., 5:52 p. m., New York will send reports from—	New York, Portland, Mount Washington, Boston, New London, Cape May, Philadelphia, Baltimore, Washington, Lynchburgh, Knoxville, Montreal,

NOTES.

1. Each station will take down the reports sent by the others, in regular succession, so that when the last one finishes, all of them will have the full reports from the others, and furnish them to the local papers for publication.
2. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
3. The time given for sending reports is the local time of that particular station.
4. The time given for sending reports is the local time of that particular station.

PAPER 20.

[Working forms of circuit.]

CIRCUIT No. 14.—GRAND HAVEN AND DETROIT.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

GRAND HAVEN TO DETROIT.

DETROIT TO GRAND HAVEN.

At 7.23 a. m., 4.23 p. m.,
and 11.23 p. m., Grand
Haven will send—At 7.51 a. m., 4.51 p. m.,
and 11.51 p. m., Detroit
will send reports from—To—
Detroit.Detroit,
Chicago,
Milwaukee,
Escanaba,
Marquette,
Buffalo,
Cleveland,
Toledo,
Oswego,
To—
Grand Haven.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 21.

[Working forms of circuit.]

CIRCUIT No. 15.—MILWAUKEE AND MARQUETTE.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

MARQUETTE TO MILWAUKEE.

MILWAUKEE TO MARQUETTE.

At 7.19 a. m., 4.19 p. m.,
and 11.19 p. m., Mar-
quette will send—At 7.21 a. m., 4.21 p. m.,
and 11.21 p. m., Esca-
naba will send—At 7.36 a. m., 4.36 p. m.,
and 11.36 p. m., Mil-
waukee will send re-
ports from—Through—
Escanaba,To—
Milwaukee.To—
Milwaukee.Milwaukee,
Oswego,
Buffalo,
Cleveland,
Toledo,
Detroit,
Grand Haven,
Chicago,
Du Luth,
St. Paul,
To—
Marquette.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 22.

[Working forms of circuit.]

CIRCUIT No. 16.—MILWAUKEE AND DU LUTH.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

DU LUTH TO MILWAUKEE.		MILWAUKEE TO DU LUTH.
At 7 a. m., 4 p. m., and 11 p. m. Duluth will send through—	At 6.57 a. m., 3.57 p. m., and 10.57 p. m., St. Paul will send—	At 7.36 a. m., 4.36 p. m., and 11.36 p. m., Milwaukee will send reports from—
St. Paul,		Milwaukee, Chicago, Omaha, Marquette, Detroit, Escanaba, Grand Haven, Cleveland, Buffalo,
To— Milwaukee.	To— Milwaukee.	To— Duluth.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 23.

[Working forms of circuit.]

CIRCUIT No. 17.—CHICAGO AND PITTSBURGH.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

PITTSBURGH TO CHICAGO.	CHICAGO TO PITTSBURGH.
At 7.48 a. m., 4.48 p. m., and 11.48 p. m., Pitts- burgh will send—	At 7.33 a. m., 4.33 p. m., and 11.33 p. m., Chicago will send reports from—
	Chicago, New Orleans, Memphis, Nashville, Cincinnati, Cairo, St. Louis, St. Paul, Davenport, Cleveland, Buffalo, Detroit, Shreveport, Louisville, Vicksburgh,
To— Chicago.	To— Pittsburgh.

NOTES.

1. Each station will take down the report sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 24.

[Working forms of circuit.]

CIRCUIT No. 18.—CHICAGO AND NEW ORLEANS.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

NEW ORLEANS TO CHICAGO.						CHICAGO TO NEW ORLEANS.
At 7.13 a. m., 4.13 p. m., and 11.13 p. m. New Orleans will send reports from—	At 7.08 a. m., 4.02 p. m., and 11.02 p. m. Vicksburg will send—	At 7.11 a. m., 4.11 p. m., and 11.11 p. m. Memphis will send—	At 7.53 a. m., 4.23 p. m., and 11.23 p. m. Nashville will send—	At 7.36 a. m., 4.36 p. m., and 11.36 p. m. Louisville will send—	At 7.24 a. m., 4.24 p. m., and 11.24 p. m. Indianapolis will send—	At 7.37 a. m., 4.37 p. m., and 11.37 p. m. Chicago will send reports from—
New Orleans, Galveston, Mobile, Augusta, Wilmington, Charleston, Savannah, Key West, Punta Raza, Jacksonville, Norfolk, Shreveport,						Chicago, St. Paul, Davenport, Omaha, Leavenworth, St. Louis, Cairo, Cincinnati, Pittsburgh, Buffalo, New York, Boston, Portland, Baltimore,
To— Chicago.	To— Chicago.	To— Chicago.	To— Chicago.	To— Chicago.	To— Chicago.	To— New Orleans.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 25.

[Working forms of circuit.]

CIRCUIT No. 19.—CHICAGO AND CAIRO.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

CAIRO TO CHICAGO.		CHICAGO TO CAIRO.
At 7.11 a. m., 4.11 p. m., and 11.11 p. m., Cairo will send through	At 7.08 a. m., 4.08 p. m., and 11.08 p. m., St. Louis will send reports from—	At 7.28 a. m., 4.28 p. m., and 11.28 p. m., Chicago will send reports from—
St. Louis,	St. Louis, * Leavenworth,	Chicago, Pittsburgh, Cincinnati, Nashville, Memphis, New Orleans, Davenport, St. Paul, Omaha, Galveston, Vicksburgh, Louisville, Shreveport, To— Cairo.
To— Chicago.	To— Chicago.	

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 26.

[Working forms of circuit.]

CIRCUIT No. 20.—ST. LOUIS AND LEAVENWORTH.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

LEAVENWORTH TO ST. LOUIS.

ST. LOUIS TO LEAVENWORTH.

At 6.48 a. m., 3.48 p. m., and 10.48 p. m., Leavenworth will send to—

At 7.08 a. m., 4.08 a. m., 11.08 p. m., St. Louis will send reports from—

St. Louis.

New Orleans,
Chicago,
St. Paul,
Pittsburgh,
Davenport,
Cairo,
Galveston,
Vicksburgh,
Memphis,
Nashville,
Louisville,
Cincinnati,
St. Louis,
Omaha,
To—
Leavenworth.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 27.

[Working forms of circuit.]

CIRCUIT No. 22.—NEW ORLEANS AND GALVESTON.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

GALVESTON TO NEW ORLEANS.	NEW ORLEANS TO GALVESTON.
At 6.49 a. m., 3.49 p. m., and 10.49 p. m., Galveston will send to—	At 7.09 a. m., 4.09 p. m., and 11.09 p. m., New Orleans will send reports from—
New Orleans.	New Orleans. Key West, Mobile, Savannah, Charleston, Wilmington, Norfolk, Baltimore, Punta Rasa, Jacksonville, Shreveport, New York, Boston, Portland, Me., Memphis, Cairo, St. Louis, Cincinnati, To— Galveston.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 28.

[Working forms of circuit.]

CIRCUIT No. 23.—CHICAGO AND SAN FRANCISCO.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SAN FRANCISCO TO CHICAGO.					CHICAGO TO SAN FRANCISCO.
At 5.07 a. m. 2.07 p. m. and 9.07 p. m. San Francisco will send reports from—	At 5.44 a. m. 2.44 p. m. and 9.44 p. m. Corinne will send reports from—	At 6.12 a. m. 3.12 p. m. and 10.12 p. m. Cheyenne will send reports from—	At 6.46 a. m. 3.46 p. m. and 10.46 p. m. Omaha will send—	At 7.06 a. m. 4.06 p. m. and 11.06 p. m. Davenport will send—	At 7.31 a. m. 4.31 p. m. and 11.31 p. m. Chicago will send to—
San Francisco, San Diego, Portland, Oregon, <i>Through—</i> Corinne, Cheyenne, Omaha, Davenport,	Corinne, Fort Benton, Virginia City, <i>Through—</i> Cheyenne, Omaha, Davenport,	Cheyenne, Santa Fé, Denver, <i>Through—</i> Omaha, Davenport,	<i>Through—</i> Davenport.		Davenport, Boston, New York, Charleston, Key West, New Orleans, Buffalo, Cleveland, Chicago, St. Paul, Du Luth, Nnoxville, Mt. Washington, Leavenworth, Galveston, Vicksburgh, Memphis, Louisville, St. Louis, Shreveport.
To— Chicago.	To— Chicago.	To— Chicago.	To— Chicago.	To— Chicago.	

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of 20 words. The afternoon and night reports will consist of 10 words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 29.

[Working forms of circuit.]

CIRCUIT No. 24.—CHICAGO AND KEOKUK.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

KEOKUK TO CHICAGO.		CHICAGO TO KEOKUK.	
At 7.02 a. m., 4.02 p. m., and 11.02 p. m., Keokuk will send—		At 7.19 a. m., 4.19 p. m., and 11.19 p. m., Chicago will send reports from—	
To— Chicago.		Chicago, Pittsburgh, Buffalo, Cincinnati, San Francisco, Corinne, Cheyenne, Omaha, Davenport, Milwaukee, St. Paul, Cairo, St. Louis, To— Keokuk.	Leavenworth, Indianapolis, Nashville, New Orleans, Key West, Savannah, New York, Washington, Norville, Philadelphia, Shreveport, Vicksburg, Louisville, To— Keokuk.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of 20 words. The afternoon and night reports will consist of 10 words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 30.

[Working forms of circuit.]

CIRCUIT No. 25.—NEW ORLEANS AND SHREVEPORT.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SHREVEPORT TO NEW ORLEANS.		NEW ORLEANS TO SHREVEPORT.
At 6.53 a. m., 3.53 p. m., and 10.53 p. m., Shreveport will send—		
<p style="text-align: right;">To—</p> <p>New Orleans.</p>		

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of 20 words. The afternoon and night reports will consist of 10 words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 31.

[Working forms of circuit.]

Circuit No. 26.—SAN FRANCISCO AND PORTLAND.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

PORTLAND TO SAN FRANCISCO.	SAN FRANCISCO TO PORTLAND.
At 4.57 a. m., 1.57 p. m., and 8.57 p. m., Portland will send to—	At 4.59 a. m., 1.59 p. m., and 8.59 p. m., San Francisco will send reports from—
San Francisco.	San Francisco, San Diego, To— Portland.

NOTES

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

REPORT OF THE SECRETARY OF WAR.

PAPER 32.

[Working forms of circuit.]

CIRCUIT No. 27.—SAN FRANCISCO AND SAN DIEGO.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SAN DIEGO TO SAN FRANCISCO.	SAN FRANCISCO TO SAN DIEGO.
At 5.19 a. m., 2.19 p. m., and 9.19 p. m., San Diego will send to—	At 4.59 a. m., 1.59 p. m., and 8.59 p. m., San Francisco will send reports from—
San Francisco.	San Francisco, Portland, To— San Diego.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 33.

[Working forms of circuit.]

CIRCUIT No. 28.—CHEYENNE AND SANTA FÉ.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

SANTA FÉ TO CHEYENNE.	CHEYENNE TO SANTA FÉ.
At 5.59 a. m., 2.59 p. m., and 9.59 p. m., Santa Fé will send—	At 6.04 a. m., 3.04 p. m., and 10.04 p. m., Denver will send—
Through— Denver. To— Cheyenne.	To— Cheyenne.

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 34.

[Working forms of circuit.]

CIRCUIT No. 29.—CORINNE AND FORT BENTON.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

FORT BENTON TO CORINNE.		CORINNE TO FORT BENTON.
At 5.41 a. m., 2.41 p. m., and 9.41 p. m., Fort Benton will send—	At 5.36 a. m., 2.36 p. m., and 9.36 p. m., Vir- ginia City will send—	
Through— Virginia City. To— Corinne.	To— Corinne.	

NOTES.

1. Each station will take down the reports sent by the others in regular succession, so that when the last one finishes, all of them will have the full reports from the others.
2. Each intermediate station will take down the above reports as they pass over the line. Copies of these reports will be bulletined in the rooms of the different boards of trade, and furnished to the local papers for publication.
3. The morning report will consist of twenty words. The afternoon and night reports will consist of ten words each.
4. The time given for sending reports is the local time of that particular station.

PAPER 35.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., July 18, 1871.

SIR: According to your request, the following report is furnished, regarding the rates for telegraphic service submitted on June 26, 1871, for your consideration, by Hon. William Whiting, special assistant to the Attorney General, and specified in your subsequent order dated June 29, 1871.

In March last it was considered by this office important to obtain, by personal interviews between its officers and the representatives of the most important telegraph companies of the United States, a full understanding, and, if possible, an adjustment of the subjects both of compensation and also of special facilities required, in regard to which difficulties had arisen.

Brevet Lieutenant Colonel Garrick Mallory and Brevet Captain H. W. Howgate, both of United States Army, and acting signal officers, on duty at this office, were, on March 20, 1871, designated by the War Department to represent it in conference with officers of the several companies, and took part in all the meetings held.

On April 4, 1871, Hon. William Whiting was commissioned as special assistant to the Attorney General of the United States, in relation to matters in controversy between the Government and the telegraph companies of the United States, and was instructed to act in co-operation with the Chief Signal Officer of the Army, who met him and participated in the various subsequent meetings and discussions.

The above-named officers met, at different times and places in reference to the above-named duty, the president, vice-president, and electrician of the Western Union Telegraph Company, (who also represented the Northwestern Telegraph Company;) the president, general superintendent, and secretary of the Pacific and Atlantic Telegraph Company; the general superintendent of the Atlantic and Pacific Telegraph Company; the president and superintendent of the Franklin Telegraph Company; and the president and treasurer of the International Ocean Telegraph Company.

In these meetings were obtained a mass of reports, estimates, and other statistics, verified in many cases by reference to the books of the companies, which were made fully accessible.

The purpose of the representatives of the Government, persistently adhered to, was to ascertain the actual cost to the telegraph companies for the service required for the weather-reports, Signal Service, fairly estimated, with proper allowance for the difference in cost between that particular service and ordinary commercial, or press business. It was also proposed, after ascertaining that cost, to allow a fair profit upon it; the profit of 30 per cent. being the one used in the general calculations.

The result of many and prolonged consultations was that part of the above-mentioned order relating to the weather-reports, Signal Service, which is in the following language:

"The rate for all telegraphic communications known as the 'Signal Service messages and reports,' shall be two cents for each word of said reports and messages for each circuit over which it may pass, in accordance with the schedule of circuits and plans of the Chief Signal Officer of the Army, which are now adopted, or may hereafter be adopted by him, for transmitting these dispatches, or such part thereof as he may designate, in such words or ciphers as may, from time to time, be directed by him. The amount thus estimated is to be taken in full payment for said dispatches, no additional allowance to be made for drops, office messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said Signal Service messages and reports."

This rate was voluntarily and in advance of your order assented to by the Western Union Telegraph Company, and the following table exhibits the comparative cost of transmitting the weather-reports for the forty-eight stations, being eighteen circuits actually in operation on July 1, 1871, according to the provisions of your order, as contrasted with the commercial rates previously charged and paid.

Circuits.	WEATHER REPORTS.		
	Number of words.	Cost by Postmaster General's order.	Commercial rates for the same number of words.
Galveston and New Orleans	704	\$14 08	\$29 76
New York and Milwaukee	2,024	40 48	74 88
Burlington and Boston	264	5 28	4 84
Lake City and New York	2,112	42 24	176 00
Augusta and New Orleans	396	7 92	26 36
Cairo and Chicago	572	11 44	20 96
New Orleans and Chicago	1,144	22 88	95 52
San Francisco and Chicago	220	4 40	23 32
Pittsburgh and Chicago	572	11 44	14 30
Portland and New York	2,112	42 24	35 20
Grand Haven and Detroit	440	8 80	12 40
Mt. Washington and Boston	44	88	..
Knoxville and Washington	74	1 76	..
Chicago and Davenport	308	6 16	7 76
Leavenworth and St. Louis	572	11 44	20 96
Milwaukee and Marquette	528	10 56	36 96
Milwaukee and Duluth	464	9 28	38 72
Lake City and Key West	396	7 92	32 40
One day	12,960	259 60	655 20
Three months, 30, 31, 31—92 days	1,194,160	23,883 20	63,040 14

This statement shows a saving to the United States for a service of three months of \$39,157 04, being at the rate of over 62 per cent.

The additions to and changes in this service, to be made from time to time, will not probably reduce this rate of saving.

It will be understood that the weather-reports of the Signal Service are necessarily sent over defined and established circuits, and circuits of great length under different circumstances from messages of any other character, and therefore required special provision, an essential part of the plan being that the reports of observations should be furnished by what is technically called "drops," at many points intermediate between those of transmission and address. This increased the amount of service rendered, and occasioned the recommendation of a rate which would compensate in fact for the "drops," while it was not practicable to consider them directly as the basis of calculation.

Under the general instructions to Mr. Whiting, it was also proper and necessary to examine and report upon the rates considered to be fair for the transmission of telegraphic communications between the several Departments of the Government of the United States and their officers and agents, other than the Signal Service messages, and observing the same principle before alluded to, the result was reported to you in the following language: "One cent per word for each circuit through which it shall be transmitted, said rates to be computed subject to the following conditions, viz: A distance of two hundred and fifty miles, as computed by the tables of the Post-Office Department, shall be deemed a circuit. If, on computing circuits, there shall be found one or more circuit, and a fraction of a circuit, such fraction shall be deemed a circuit."

If a communication shall be sent a distance less than two hundred and fifty miles, that distance shall be deemed a circuit.

All words of the communication transmitted are to be counted, excepting the date and place at which such communication is filed. No communication to be at a rate less than 25 cents.

The unit of a distance, two hundred and fifty miles, mentioned in this part of the report as above submitted to you, was found to be the average length of circuit over which messages in the United States were transmitted.

This rate was substantially acceded to, in advance of your order, by the Western Union and the Franklin Telegraph Companies.

The following table exhibits the rates of late actually charged to the Departments of the United States by the several telegraph companies, and the cost to the United States for the same messages and distances, according to the rate established by you, sixty-five of the most important telegraphic stations in the United States being taken for example, with Washington as the point of transmission.

	Com'l.	Gov't.	Com'l.	Gov't.		Com'l.	Gov't.	Com'l.	Gov't.
	13 body words.	30 total words.	100 body words.	100 total words.		13 body words.	30 total words.	100 body words.	100 total words.
Albany, N. Y.	\$0 95	\$0 60	\$5 30	\$2 00	Lewes, Del.	\$0 77	\$0 30	\$4 25	\$1 00
Poughkeepsie, N. Y.	85	60	5 20	2 00	New Castle, Del.	67	30	4 15	1 00
Augusta, Ga.	1 98	90	11 55	3 00	Memphis, Tenn.	1 49	1 20	8 45	4 00
Baltimore, Md.	26	34	2 00	1 00	Milwaukee, Wis.	1 31	1 20	7 40	4 00
Annapolis, Md.	36	30	2 10	1 00	Green Bay, Wis.	2 18	1 20	11 75	4 00
Elkton, Md.	51	30	3 15	1 10	Mobile, Ala.	3 01	1 50	17 80	5 00
Bangor, Me.	1 08	90	6 48	3 00	Montgomery, Ala.	2 88	1 20	16 80	4 00
Boston, Mass.	1 67	60	4 15	2 00	Nashville, Tenn.	1 21	90	7 30	3 00
Buffalo, N. Y.	1 08	60	6 30	2 00	New London, Conn.	52	60	4 20	2 00
Burlington, Vt.	1 55	90	9 40	3 00	Palmer, Mass.	67	60	4 15	2 00
Calro, Ill.	2 16	1 20	12 60	4 00	New Orleans, La.	3 01	1 50	17 80	5 00
Charleston, S. C.	1 98	90	11 55	3 00	New York, N. Y.	49	30	3 10	1 00
Cheyenne, Wyo. Ter.	5 17	2 40	30 40	8 00	Norfolk, Va.	3 06	1 20	3 10	1 00
Chicago, Ill.	1 21	1 20	7 30	4 00	Omaha, Nebr.	3 06	1 20	17 80	6 00
Cincinnati, Ohio	59	90	3 20	3 00	Oswego, N. Y.	1 08	60	6 30	2 00
Cleveland, Ohio	1 31	90	7 40	3 00	Philadelphia, Pa.	41	30	2 15	1 00
Davenport, Iowa.	1 80	1 50	10 30	5 00	West Chester, Pa.	77	30	4 25	1 00
Des Moines, Iowa.	2 55	1 50	15 80	5 00	Pittsburgh, Pa.	31	60	2 05	2 00
Denver, Col.	4 90	2 40	31 00	8 00	Portland, Me.	90	90	5 25	3 00
Detroit, Mich.	1 57	90	9 40	3 00	Rochester, N. Y.	1 08	60	6 30	2 00
Monroe, Mich.	1 57	90	9 40	3 00	Canandaigua, N. Y.	1 21	60	7 30	2 00
Jackson, Mich.	1 80	90	10 50	3 00	Savannah, Ga.	2 34	90	13 65	2 00
Ft. Benton, Mont.	9 05	3 90	52 55	13 00	St. Louis, Mo.	2 11	1 20	12 55	4 00
Ft. Smith, Ark.	3 78	1 80	22 05	6 00	Alton, Ill.	2 29	1 20	13 60	4 00
Galveston, Tex.	4 81	2 10	28 30	7 00	San Diego, Cal.	8 51	4 50	49 40	15 00
Grand Haven, Mich.	2 03	1 20	11 60	4 00	San Francisco, Cal.	5 99	3 90	34 70	13 00
Indianapolis, Ind.	59	90	3 20	3 00	Santa Fé, N. M.	6 72	2 70	53 60	9 00
Penn Yan, N. Y.	1 62	60	9 45	2 00	Springfield, Ill.	2 29	1 20	13 60	4 00
Terre Haute, Ind.	2 03	1 20	11 60	4 00	Toledo, Ohio	1 57	90	9 40	3 00
Jackson, Miss.	3 42	1 20	19 95	4 00	Oberlin, Ohio	1 31	90	7 40	3 00
Louisville, Ky.	90	90	5 25	3 00	Wilmington, N. C.	1 44	60	8 40	2 00
New Albany, Ind.	1 62	90	9 45	3 00					
Leavenworth, Kans.	3 06	1 50	17 85	5 00					
Topeka, Kans.	3 24	1 80	18 90	6 00					
					Average difference..	2 29	1 25	13 98	4 14

In explanation of this table, it may be stated that experience shows messages of 13 "body words" (the address and signature being omitted) to be properly considered equivalent to those of 30 "total words," under the terms of your order.

Calculations made from the above table show an average saving to the United States beyond what had been paid previous to the date of your order, in the case of the shorter messages classified as above, of 45 per cent., and in the longer messages of 70 per cent., which rate increases in favor of the United States when the number of words exceeds one hundred.

It was further insisted upon by the representatives of the United States that the proper construction of the act of Congress approved July 24, 1866, entitled "An act to aid in the construction of telegraph lines, and to secure to the Government the use of the same for postal, military, and other purposes," was that all telegraphic communications in relation to the affairs or business of the United States by its civil or military officers, agents, or employees, in their transmission over the lines of the companies which had accepted the provisions of that act, should be entitled to priority over all other business, and also that the said companies are not entitled to receive prepayment therefor, but are bound to receive compensation therefor, at rates to be annually fixed by the Postmaster General. No objection is made on the part of the several companies conferred with to the above construction.

Attached hereto are copies of several papers considered of importance as connected with the above report.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brigadier General and Chief Signal Officer of the Army.

The Hon. the POSTMASTER GENERAL.

SUB-PAPER 1.

Proposed rates for Signal-Service messages and reports, as assented to by the Western Union Telegraph Company.

"The rate for all Government dispatches known as the Signal-Service messages and reports are and shall be fixed for the year commencing May 24, 1871, as follows, viz: two cents for each word of said reports and messages for each circuit over which it may pass, in accordance with the schedule of circuits and plans of the Chief Signal Officer of the Army which are now adopted, or may hereafter be adopted by him, for transmitting these dispatches, or such part thereof as he may designate, in such words or ciphers as may, from time to time, be directed by him. The amount thus estimated to be taken in full payment for such dispatches, no additional allowances to be made for drops, office messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said Signal-Service messages and reports."

The above is satisfactory, and the service may commence at once.

WILLIAM ORTON,

President Western Union Telegraph Company.

NEW YORK, May 8, 1871.

SUB-PAPER 2.

Letter of Wm. Orton, president of the Western Union Telegraph Company, proposing terms for departmental telegraphy other than that of the weather-reports.

WASHINGTON, D. C., June 24, 1871.

SIR: The Western Union Telegraph Company will consent to the fixing, by the Postmaster General, of the following rates for telegraphic service for the several Departments of the Government, for the fiscal year 1871-'72, (excepting the weather-reports,) viz: One cent per word for each circuit of two hundred and fifty miles, or fractional part thereof, all words to be counted except the date and the place at which a message is filed. Provided, however, that no message shall be counted as less than 25 words. Distances to be computed by the tables of the War Department.

I have the honor to be, very respectfully, &c.,

WILLIAM ORTON,

President.

Hon. WM. WHITING,

Assistant Attorney General of the United States.

SUB-PAPER 3.

Letter of the president of the Pacific and Atlantic Telegraph Company to Mr. Whiting, proposing terms for the Department telegraphing other than that of the weather-reports.

WASHINGTON, D. C., June 24, 1871.

SIR: Our company are of the opinion that, for the service for which proposals are asked in the foregoing letter, the following would be a just rate of compensation: A message shall be held to be 30 words or less, all words or figures to be counted. A unit of distance shall be held to be two hundred and fifty miles. The rate of compensation to be one cent per word for each unit of distance, all portions of the unit to be deemed as a unit. No message to be less than 30 cents.

Very respectfully,

GEO. H. THURSTON,

President of the Pacific and Atlantic Telegraph Company.

Hon. WM. WHITING,

Assistant Attorney General of the United States.

SUB-PAPER 4.

Proposal of the Franklin Telegraph Company for Signal Service.

NEW YORK, May 12, 1871.

SIR: In reply to your letter of the 11th, I conclude, without consultation with any other lines, to make our offer at once, on the lowest basis we can afford, two cents per word, counting address and signature, for our entire line through Baltimore, New York, Philadelphia, or Boston, and everything intermediate.

Yours respectfully,

GEORGE H. ELLERY,
President.

Captain H. W. HOWGATE,
Acting Signal Officer and Assistant.

SUB-PAPER 5.

Memorandum of Hon. W. Whiting, filed with Chief Signal Officer, after interview with the General Superintendent of Franklin Telegraph Company.

The Franklin Telegraph Company, represented by J. G. Smith, general superintendent, agree to the rates for the general business of the Department, as proposed by us.

W. WHITING.

JUNE 26, 1871.

SUB-PAPER 6.

Rights of the Government against the telegraph companies in relation to priority of service and the mode of payment therefor, as stated by Mr. Whiting, and assented to by the Western Union Telegraph Company.

Whereas questions have heretofore arisen between the Departments of the Government and certain telegraph companies, in respect to the obligations imposed by law upon such companies as have filed their written acceptance with the Postmaster General of the restrictions and obligation of the act of Congress approved July 24, 1866, entitled "An act to aid in the construction of telegraph-lines, and to secure to the Government the use of the same for postal, military and other purposes;" in order to prevent future misunderstandings, it is claimed by Mr. Whiting, acting on behalf of the United States, as assistant to the Attorney General of the United States, that, by the true interpretation of the aforesaid statute, all telegraphic communications in relation to the affairs or business of the United States, by its civil or military officers, agents, or employes, are entitled, in their transmission over the telegraphic lines of said companies, to priority over all other business; also, that said companies are not entitled to receive prepayment therefor, but are bound to receive compensation therefor, at rates to be annually fixed by the Postmaster General.

The Western Union Telegraph Company will make no objection to this construction of the said statute.

THE WESTERN UNION TELEGRAPH COMPANY,
By WILLIAM ORTON, *President*.
WILLIAM WHITING, *Assistant to the Attorney General, &c.*

WASHINGTON, June 24, 1871.

PAPER 36.

*Rates of pay for communications by telegraph, 1871-'72.**

POST-OFFICE DEPARTMENT, June 29, 1871.

Whereas, by the act of Congress approved July twenty-fourth, A. D. eighteen hundred and sixty-six, entitled "An act to aid in the construction of telegraph-lines, and to secure to the Government the use of the same for postal, military, and other purposes," in section second it is enacted that telegraphic communications between the several Departments of the Government of the United States and their officers and agents shall, in their transmission over the lines of said companies, have priority over all other business, and shall be sent at rates to be annually fixed by the Postmaster General:

Now, therefore, in pursuance and by virtue of the authority on me by said act conferred,

I, J. A. J. Creswell, Postmaster General of the United States, do hereby fix the rates at which the telegraphic communications aforesaid shall be sent, for the year commencing on the first day of July, A. D. eighteen hundred and seventy-one, as follows, namely:

The rate for all telegraphic communications known as the Signal-Service messages and reports shall be two cents for each word of said reports and messages for each circuit over which it may pass, in accordance with the schedule of circuits and plans of the Chief Signal Officer of the Army, which are now adopted or may hereafter be adopted by him for transmitting these dispatches, or such part thereof as he may designate, in such words or ciphers as may, from time to time, be directed by him. The amount thus estimated is to be taken in full payment for said dispatches, no additional allowance to be made for drops, office-messages, or other services or special facilities required by the Chief Signal Officer for the correct and prompt transmission of said Signal-Service messages and reports.

The rate for all telegraphic communications aforesaid, other than the said Signal-Service messages and reports, shall be as follows, viz: One cent per word for each circuit * through which it shall be transmitted, said rate to be computed subject to the following conditions, viz:

A distance of two hundred and fifty miles, as computed by the tables of the Post-Office Department, shall be deemed a circuit.

If, on computing circuits, there shall be found one or more circuits and a fraction of a circuit, such fraction shall be deemed a circuit.

If a communication shall be sent a distance less than two hundred and fifty miles, that distance shall be deemed a circuit.

All words of the communication transmitted are to be counted, excepting the date and place at which such communication is filed; no communication to be at a rate less than twenty-five cents.

JNO. A. J. CRESWELL,
Postmaster General.

POST-OFFICE DEPARTMENT,
Washington, D. C., July 29, 1871.

As a question has been raised in regard to the meaning of the last sentence of the concluding paragraph of the order issued by me, under date of June 29, 1871, concerning the rate to be charged for telegraphic communications between the officers and agents of the several Departments of the Government of the United States, which sentence is as follows, to wit: "no communication to be at a rate less than twenty-five cents," it is hereby further ordered that the same shall be construed as follows, to wit:

All messages of less than twenty-five words, address and signature included, will be rated as if containing twenty-five words; but all messages exceeding twenty-five words will be rated by the exact number of words they contain, address and signature included.

JNO. A. J. CRESWELL,
Postmaster General.

* The word "circuit," as here used, means, not a telegraphic circuit, but a unit of distance of two hundred and fifty miles.

PAPER 32.

Detailed synopses and probabilities for Tuesday, October 31.

Tuesday, October 31, 7.35 a. m.					
	Barometer.	Thermometer.	Winds.	Weather.	Humidity, per ct.
San Francisco.	30.19 S.	53 S.	N. Bk.	Clear	0.73 Fu.
Rocky Mountains.	30.38 S. and 29.97 Fu.	22 Fu and 17 S.	N. 3 and NW. 2	Fair and clear	.84 and .67 S.
Central Valley.	29.40 Fu-30.10 Fu.	44 S-58 Rn and 35 S.	SE. 7-N.E. 1-10 and N. 19	Rain and T.	.89 Rn-0.80 Rn.
Gulf, western.	30.08 Fu and 29.92 S.	51 Fu and 68 S.	NW. 16 and SE. 3	Clearing and cloudy	.71 Fu-0.91 Rn.
Gulf, eastern.	29.98 Fu-30.05 S.	70 S-75 S and Rn.	E. 6-0 and NE. 12	Cloudy	.95 Rn.
Key West.	30.00 Rn.	78 S.	SE. 8.	Hazy	.75 Fu.
South Atlantic.	30.13 Fu-30.31 Fu.	70 S and 58 Rn.	0 and S.	Cloudy and fair	.95 Rn-0.90 Rn.
Middle Atlantic.	30.36 Fu-30.31 S.	54 S-48 S.	0 and SW. 2-11	Fair	.95 Rn-0.85 Rn.
East Atlantic.	30.31 S-30.30 S and Fu.	52 Rn-43 S.	SW. 11-0.	Fair, cloudy, and smoky	.85 Rn-0.70 Rn.
Ontario.	30.20 S-30.23 S.	47 S and 46 S.	NW. and N. 4	Fair and cloudy.	.60 Fu * 0.77 Rn.
Erie.	30.21 S-30.17 Fu.	56 Rn-45 S.	NE. 7-12	Rainy, cloudy, and smoky.	.90 Rn-0.80 Rn.
Huron.	30.15 S-30.25 Fu and S.	44 Rn-36 Rn.	NE. 24-N. 5	Light rain and cloudy.	.93 Rn-0.90 Rn.
Michigan.	30.13 Fu-30.30 Fu.	36 Rn-28 S.	0 and light	Cloudy	.80 Rn.
Superior.	30.26 Fu-30.36 Fu.	37 S-28 Fu.	N. 5 and 12	Cloudy	.98 S-0.77 Fu.
Northwest.	30.37 Fu-30.30 Fu.				0.00.
Note of reference.					
S. stationary; Fg. falling; Fu. fallen; Rg. rising; Rn. risen; D. denotes that rains fall during the day; E. denotes that rains fall during the evening; N. denotes that rains fall during the night; I. safety; II. warning; T. threatening.					
Tuesday, October 31, 4.35 p. m.					
	Barometer.	Thermometer.	Winds.	Weather.	Signals.
San Francisco.	Fg and Rg.	Rg and Fg.	SE-SW and NW	Rain-clearing	II.
Rocky Mountains.	Rg.	Fg.	NW	Cloudy and clearing	II and I.
Central Valley.	S and Fg.	Rg.	NE-SE	Cloudy and rain.	I.
Gulf, western.					I.
Gulf, eastern.					I.
Key West.					I.
South Atlantic.	Fg.	S and Rg.	E.	Rain and cloudy	I.
Middle Atlantic.	Fg.	Rg.	SE-SW	Cloudy	I.
East Atlantic.	Fg.	S.	SE	Cloudy	I.
Ontario.	Fg.	Rg.	NE-SE.	Cloudy.	I and II.
Erie.	Fg.	Rg.	NE.	Rain and T.	II and I.
Huron.	Fg.	Rg.	NE.	Rain and cloudy.	I.
Michigan.	Fg.	Rg and S.	NE. light and fresh	Cloudy and T.	I.
Superior.	Fg and S.	S and Rg.	NE-SW	Cloudy	I.
Northwest.	Fg.				

The highest pressure extends from North Carolina to New Jersey, and a similar area exists in the extreme northwest. The lowest barometer has advanced northward into Missouri, with brisk winds from Kansas to Michigan. Rising barometer with brisk northwest winds in Texas. The area of low barometer and rain will probably by this evening extend over Lakes Michigan and Ontario, and from the South Atlantic coast to the Ohio Valley.

PAPER 39—FORM 15.

This official report is furnished the press with the explicit understanding that it shall not be altered or garbled, and that any paper using it at all will follow the precise wording given below the line. There is danger that incorrect or altered reports may greatly mislead the public and bring discredit upon the service. Editors are requested to insist upon the accurate following of the copy.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, D. C., ———, 1871.

SYNOPSIS FOR THE PAST TWENTY-FOUR HOURS.

* * * *

* * * *

PROBABILITIES.

* * * *

* * * *

WARNING SIGNALS ORDERED.

* * * *

* * * *

PAPER 40.

[Circular.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE,
Washington, D. C., ———, 1871.

SIR: Under a joint resolution of Congress approved February 9, 1870, a copy of which is hereto annexed, the duty was imposed upon the Secretary of War of causing meteorological observations to be taken, and of giving notice by telegraph and signal of the approach and force of storms. By order of the Secretary of War, the Chief Signal Officer of the Army is specially charged with the execution of this duty.

It will be observed that the language and original intent of the resolution contemplated directly the benefit of the commerce of the United States. Indirect advantage would naturally accrue to other industries, but it is certain that the reports of this division may be made directly useful to agriculture, since, after sufficient notice, the operations of the farm might frequently be so ordered as to avoid the serious losses occasioned by storms. It is also true that the observations taken and made public, which involve particulars regarding heat, moisture, wind, rain, cloud, and electricity, from which statistics valuable for particular localities are compiled, and general laws relating to climate can be deduced, must be of importance to every scientific or intelligent agriculturist.

The Secretary of War has directed the Chief Signal Officer to render the work of this division available for the benefit of agriculture, to the full extent of the power so far granted by law and of the facilities attained or attainable by this office, the latter being limited by the appropriations made or to be made by Congress.

The following-named stations are now established, viz.:

Portland, Maine.
Boston, Massachusetts.
New London, Connecticut.
New York City, New York.
Philadelphia, Pennsylvania.
Baltimore, Maryland.
Washington, District of Columbia.
Wilmington, North Carolina.
Charleston, South Carolina.
Norfolk, Virginia.
Oswego, New York.
Rochester, New York.
Buffalo, New York.
Cleveland, Ohio.
Toledo, Ohio.
Detroit, Michigan.
Chicago, Illinois.
Milwaukee, Wisconsin.
Grand Haven, Michigan.
Escanaba, Michigan.
Marquette, Michigan.
Davenport, Iowa.
Leavenworth, Kansas.
Cairo, Illinois.
Cape May, New Jersey.
Galveston, Texas.
Memphis, Tennessee.
Savannah, Georgia.
Augusta, Georgia.

Lake City, Florida.
Key West, Florida.
Mobile, Alabama.
New Orleans, Louisiana.
San Francisco, California.
Jacksonville, Florida.
San Diego, California.
Santa Fe, New Mexico.
St. Paul, Minnesota.
Du Luth, Minnesota.
Pittsburgh, Pennsylvania.
Knoxville, Tennessee.
Indianapolis, Indiana.
Lynchburgh, Virginia.
Burlington, Vermont.
Vicksburgh, Mississippi.
Portland, Oregon.
Denver, Colorado.
Nashville, Tennessee.
Cincinnati, Ohio.
St. Louis, Missouri.
Omaha, Nebraska.
Cheyenne, Wyoming Territory.
Corinne, Utah.
Mt. Washington, New Hampshire.
Louisville, Kentucky.
Fort Benton, Montana Territory.
Virginia City, Montana Territory.

It is intended to increase this number gradually, as the requisite telegraphic connections can be obtained, and competent observers can be enlisted and instructed.

At every station three synchronous observations are taken daily and telegraphed immediately to the central office; being also published in whole or in part at other stations. At all stations bulletins are issued within an hour after each of the three daily reports are received, and, besides being posted in public places, are furnished gratuitously to the press—the morning bulletin for the afternoon, and that of midnight for the morning papers. At the more important stations, a weather-map is also issued each morning. A copy of the weather-map and bulletin of this date is inclosed herewith.

A paper showing the synopsis and probabilities of the weather is also prepared at this office immediately after the reception of each of the three above-mentioned reports, and is furnished the Associated Press for distribution throughout the United States.

In addition to the above-mentioned observations, three others are taken at intermediate

hours, the reports of which are not telegraphed, but mailed and recorded, and, embracing further particulars, are specially designed for use in obtaining local statistics and establishing meteorological laws.

That part of the duty required by law "to give notice on the northern lakes and the seaboard, by magnetic telegraph and marine signals, of the approach and force of storms," will, on the display of signals on the shores mentioned, (for which arrangements are now in progress,) be in regular performance. It is, however, the desire and intention of this office to perform its duties, under the instructions received, in such manner as will be most useful also to the agricultural interests, and the intelligent views of gentlemen interested in the latter, as to such modifications of, or additions to, the present work as can consistently be adopted, with the above-mentioned object, are invited and will be attentively considered.

It is believed that the co-operation of agricultural and horticultural societies with this office will best conduce to success in the object to be attained, and it is suggested that practical form be given to such co-operation by the appointment, on the part of your society, of a permanent committee to confer from time to time with the Chief Signal Officer of the Army, and to take, in conjunction with him, such steps, or to recommend for the consideration of the society such action, as may be deemed desirable. Committees of a similar character have been appointed by many of the boards of trade and chambers of commerce throughout the country, with great benefit to this service as specially relating to commerce, and it is hoped that a corresponding advantage will be obtained from the selected intelligence of gentlemen interested in agriculture.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

Brig. Gen., and Chief Signal Officer of the Army.

MR. H. T. HENNING,

Secretary of the Carver County Agricultural Society, Carver, Minn.

[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION to authorize the Secretary of War to provide for taking meteorological observations at the military stations and other points in the interior of the continent, and for giving notice on the northern lakes and seaboard of the approach and force of storms.

Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he hereby is, authorized and required to provide for taking meteorological observations at the military stations in the interior of the continent, and at other points in the States and Territories of the United States, and for giving notice on the northern lakes and on the sea coast, by magnetic telegraph and marine signals, of approach and force of storms.

Approved February 9, 1870.

PAPER 41.

[Circular.]

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE,
Washington, D. C., ———, 1871.

SIR: By direction of the Chief Signal Officer of the Army, I have the honor to acknowledge and answer your communication to him of September 3, 1871, and to express his gratification at the action of the Pike County Agricultural Society in appointing your permanent committee to confer with this office, on the subjects mentioned in his circular addressed to its secretary.

The places now occupied as stations of this division were selected as of most immediate importance for meteorological purposes, combined with telegraphic facilities, and those which are gradually to be added during this year are already designated by the Secretary of War, for similar reasons, with a design to perfect the net-work of the system so far as the appropriation allows. There is, as yet, no provision for furnishing instruments to any other than the observer-sergeants, although it is probable that some such authority may hereafter be given.

Reports of observations would not be of use for the immediate purposes of this division, except as made and telegraphed according to the plans adopted, (which cannot be understood and executed without special instruction,) to do which requires the whole time of an industrious man—indeed, at most stations two instructed men are necessary. All records of meteorological observations carefully made will, however, be thankfully received, and examined with reference to the study of the science, verification of the theories entertained, and use in the publications contemplated.

It is obvious that this office is not now able to establish meteorological stations at all the points where, with increased facilities, observations could be made, and the reports of others directly received, with advantage both to the interest of agriculture and commerce. The present system is, however, so far complete—the bulletins being published at already fifty stations throughout the country, and furnished gratuitously to the local press—that at most places a newspaper can be obtained which contains a bulletin issued by this office, of that day's observations, from which, and the inclosed circular upon the practical uses of meteorological reports and weather-maps, the more important deductions can be made. If at the station nearest to you a newspaper does not print the bulletins furnished to it, there is a strong probability that, upon proper application and effort of the society you represent, it would do so. It is also supposed that in cases where delay could thereby be avoided, persons interested could make arrangements with the publisher to have copies of the newspaper containing bulletins sent in advance of its delivery by mail.

By taking advantage of these publications, gentlemen in your position can make forecasts for themselves, and furnish information to localities which cannot be reached by the "synopsis and probabilities" from this office without such delay as would defeat the object, and a local station of the society itself, which undoubtedly would be useful for its purposes, would thus be established by its committee.

Independently of plans for the future not immediately practicable, but proper to be considered with reference to enlarged facilities hoped for, this office would be gratified to receive any suggestions from your committee as to further utilizing those now existing.

I am, sir, respectfully yours,

GARRICK MALLERY,

Capt. 1st Inf., Bvt. Lt. Col. U. S. A., Acting Signal Officer and Assistant.

Mr. J. S. POPE, *Chairman Meteorological Committee,*
Pike County Agricultural Society, Zebulon, Ga.

NOTE.—The following are the places now occupied by stations of this division. At all of them bulletins are issued, giving the following particulars, viz: Height of barometer; change since last report; thermometer; change in last 24 hours; relative humidity, in per cent.; direction of wind; velocity of wind, in miles per hour; pressure of wind, in pounds per square foot; force of wind, reduced to Beaufort scale; amount of cloud; rain-fall since last report, in inches and hundredths, and state of weather.

At those places marked with a star, the number of reports received and published in the bulletin is sufficiently large to be used in the manner pointed out in the "suggestions."

- * Portland, Maine.
- * Boston, Massachusetts.
- * New London, Connecticut.
- * New York City, New York.
- * Philadelphia, Pennsylvania.
- * Baltimore, Maryland.
- * Washington, District of Columbia.
- * Wilmington, North Carolina.
- * Charleston, South Carolina.
- * Savannah, Georgia.
- * Augusta, Georgia.
- * Lake City, Florida.
- * Key West, Florida.
- * Mobile, Alabama.
- * New Orleans, Louisiana.
- * San Francisco, California.
- * Norfolk, Virginia.
- * Mt. Washington.
- * Jacksonville, Florida.
- * San Diego, California.
- * Santa Fé, New Mexico.
- * Oswego, New York.
- * Rochester, New York.
- * Buffalo, New York.
- * Cleveland, Ohio.
- * Toledo, Ohio.
- * Detroit, Michigan.
- * Chicago, Illinois.
- * Milwaukee, Wisconsin.
- * St. Paul, Minnesota.
- * Du Luth, Minnesota.

- * Pittsburgh, Pennsylvania.
- * Knoxville, Tennessee.
- * Indianapolis, Indiana.
- * Lynchburgh, Virginia.
- * Burlington, Vermont.
- * Keokuk, Iowa.
- * Grand Haven, Michigan.
- * Vicksburgh, Mississippi.
- * Portland, Oregon.
- * Denver, Colorado.
- * Escanaba, Michigan.
- * Marquette, Michigan.
- * Davenport, Iowa.
- * Leavenworth, Kansas.
- * Cairo, Illinois.
- * Cape May, New Jersey.
- * Galveston, Texas.
- * Montreal, Canada.
- * Punta Rasa, Florida.
- * Memphis, Tennessee.
- * Nashville, Tennessee.
- * Cincinnati, Ohio.
- * St. Louis, Missouri.
- * Omaha, Nebraska.
- * Cheyenne, Wyoming Territory.
- * Corinne, Utah.
- * Shreveport, Louisiana.
- * Louisville, Kentucky.
- * Fort Benton, Montana.
- * Virginia City, Montana.

CHIEF SIGNAL OFFICER.

401

PAPER 42.—FORM 14.

WAR DEPARTMENT, OFFICE OF THE CHIEF SIGNAL OFFICER,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

INSPECTION REPORT.

Diagrams of office, giving dimensions, number, and location of doors and windows. Position of instruments to be marked.	Name and number of street on which office is situated.	Price paid for rent of office, (per month.)	Name and address of person or persons from whom office is rented.
		Elevation of station above mean tide level.	Authority.

REMARKS UPON THE LOCATION OF OFFICE.

INSTRUMENTS.

Name.	Barometer.	Thermometer.	Hygrometer.	Anemometer.	Wind-vane.	Rain-gauge.	Kind of shelter, size and location, with position of instruments.
Number							
Elevation above the ground							
Condition							

REMARKS.

OFFICE FURNITURE.

Name.	Desks.	Tables.	Chairs.	Stoves.	Pails.	Brooms.	Bulletin-boards.	Clock.						
Number														
Condition														

REMARKS.

NOTE.—State how fuel and lights are obtained.

BOOKS OF REFERENCE AND RECORD, AND FORMS:

Name.	Daily journal.	Bulletin-books.	Letters sent.	Letters received.	Buchan.	Loomis.	Gayot.	Myer.	Smithsonian.	Form 1.	Form 2.	Form 3.	Form 4.	Form 5.	Form 6.	Form 7.	Form 7b.	Form 8.	Form 9.
Number																			
Condition																			

REMARKS.

BULLETINS.

Number issued of a. m. reports.	Where posted.	Number issued of p. m. reports.	Where posted.	Number issued of night reports.	Where posted.

REMARKS.

NOTE.—The style, size, and general appropriateness of the bulletin boards should be stated.

PRESS REPORTS.

Number of papers supplied with 7.35 a. m. re- ports.	Names of papers.	Number supplied with 4.35 p. m. reports.	Names of papers.	Number supplied with 11.35 p. m. reports.	Names of papers.

REMARKS.

MANIFOLD MAPS.

Number issued.	Where posted.	Condition.

REMARKS.

GENERAL REMARKS AND SUGGESTIONS.

DATE _____

STATION _____

U. S. A., A. S. O. and Inspector.

PAPER 43.—FORM 1.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.*Report of observations taken at _____, on _____ at _____ M.*

1

2

3

4

Received from observer at _____ M _____, Observer.
_____, Operator.

NOTE.—Operators will send the numeral *words* and not the figures, which are written as a *check* on the words. The numbers must always consist of five figures each. They will send only the matter inside the heavy lines, without address or signature.

PAPER 44.—FORM 2.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Telegraphic report of observations received at _____

DATE:

TIME:

Received from operator at _____ M. _____

PAPER 45.—FORM 3.—DAILY BULLETIN.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Meteorological record, _____, 187, _____ M.

(Observations taken at the same moment of time at all stations.)

Place of observation.	Height of barometer.	Change since last report.	Thermometer.	Change in last 24 hours.	Relative humidity. Per cent.	Direction of wind.	Velocity of wind. Miles per hour.	Pressure of wind. Pounds per square foot.	Force of wind reduced to Beaufort scale. (Approximately.)	Amount of cloud.	Rain-fall since last report. Inches and hundredths.	State of weather.
Albany, N. Y.												
Augusta, Ga.												
Baltimore, Md.												
Boston, Mass.												
Burlington, Vt.												
Buffalo, N. Y.												
Cape May, N. J.												
Cairo, Ill.												
Charleston, S. C.												
Cheyenne, Wyo.												
Chicago, Ill.												
Cincinnati, Ohio.												
Cleveland, Ohio.												
Corinne, Utah.												
Davenport, Iowa.												
Denver, Col.												
Detroit, Mich.												
Des Moines, Iowa.												
Du Luth, Minn.												
Escanaba, Mich.												
Fort Benton, M. T.												
Galveston, Tex.												
Grand Haven, Mich.												
Indianapolis, Ind.												
Jackson, Miss.												
Keokuk, Iowa.												
Key West, Fla.												
Knoxville, Tenn.												
Lake City, Fla.												
Leavenworth, Kans.												
Louisville, Ky.												
Lynchburgh, Va.												
Marquette, Mich.												
Memphis, Tenn.												
Milwaukee, Wis.												
Mobile, Ala.												
Montgomery, Ala.												
Mt. Washington, N. H.												
Nashville, Tenn.												
New London, Conn.												
New Orleans, La.												
New York, N. Y.												
Norfolk, Va.												
Omaha, Nebr.												
Oswego, N. Y.												
Philadelphia, Pa.												
Pittsburgh, Pa.												
Portland, Me.												
Portland, Oreg.												
Punta Rasa, Fla.												
Rocheater, N. Y.												

PUBLISHED BY ORDER OF THE SECRETARY OF WAR.

NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, Northwestern, and International Ocean Telegraph Companies, and are furnished gratuitously to such newspapers as desire to publish them for the benefit of their readers.

PAPER 46.—FORM 4.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Metereological record for the ——— ending ———, ———.

[illegible]

PAPER 47.—FORM 5.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Report of observations taken at _____, on _____, at _____.

1					
2					

Received from observer _____ M _____.

Operator.

Observer.

NOTE.—Operators will send the numeral *words* and not the figures, which are written as a *check* on the words. The numbers must always consist of five figures each. They will send only the matter inside the heavy lines, without address or signature.

PAPER 48.—FORM 6.

Received at ———, this ——— day of ———, 187—, of ——— ———, the following articles of Government property pertaining to the Signal Service, U. S. A., Division of Telegrams and Reports for the Benefit of Commerce, viz:

[illegible]

United States Army.

FORM 7b.

The following shows the state of the Wind and Weather at the same stations. The letters on the left-hand side of each column show the direction of the Wind; the following figure or figures, the velocity of the Wind in miles per hour; and the last letter the state of the Weather; c stands for clear, f for fair, d for dark (cloudy,) D for very cloudy, r for light rain, R for heavy rain, s for snow, h for hail, G for gale, and GG for great gale:

Place.	A. M.	P. M.	M.
Albany, N. Y.			
Augusta, Ga.			
Baltimore, Md.			
Boston, Mass.			
Burlington, Vt.			
Buffalo, N. Y.			
Cape May, N. J.			
Cairo, Ill.			
Charleston, S. C.			
Cheyenne, Wyo.			
Chicago, Ill.			
Cincinnati, Ohio			
Cleveland, Ohio			
Corinne, Utah			
Davenport, Iowa			
Denver, Col.			
Detroit, Mich.			
Des Moines, Iowa			
Du Luth, Minn.			
Escanaba, Mich.			
Fort Benton, Mont.			
Galveston, Tex.			
Grand Haven, Mich.			
Indianapolis, Ind.			
Jackson, Miss.			
Keokuk, Iowa			
Key West, Fla.			
Knoxville, Tenn.			
Lake City, Fla.			
Leavenworth, Kans.			
Louisville, Ky.			
Lynchburgh, Va.			
Marquette, Mich.			
Memphis, Tenn.			
Milwaukee, Wis.			
Mobile, Ala.			
Montgomery, Ala.			
Mt. Washington, N. H.			
Nashville, Tenn.			
New London, Conn.			
New Orleans, La.			
New York, N. Y.			
Norfolk, Va.			
Omaha, Nebr.			
Oswego, N. Y.			
Philadelphia, Pa.			
Pittsburgh, Pa.			
Portland, Me.			
Portland, Oreg.			
Punta Rasa, Fla.			
Rochester, N. Y.			
San Diego, Cal.			
San Francisco, Cal.			
Santa Fé, N. Mex.			
Savannah, Ga.			
Shreveport, La.			

FORM 7b.—Continued

Place.	A. M.	P. M.	M.
St. Louis, Mo
St. Paul, Minn.
Toledo, Ohio.
Washington, D. C.
Wilmington, N. C.
.....
.....
.....
.....

NOTE.—Barometer corrected for temperature and elevation. Reports are received over circuits arranged at the War Department with the Western Union, International Ocean, and Northwestern Telegraph Companies, and are furnished gratuitously to such newspapers as desire to publish them for the benefit of their readers.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS.

[illegible]

REPORT OF THE SECRETARY OF WAR.

PAPER 51.—FORM 9.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Operator's wire report, _____, 187-, ____m.

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PAPER 52.—FORM 10.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.
Washington, D. C., _____, 187-, ____m.

Telegram.]

To _____ :

PAPER 53.—FORM 11.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.
Washington, D. C., _____, 187-, ____m.

Telegram.]

To _____ :

From _____.

PAPER 54.—FORM 12.

DIVISION OF TELEGRAMS AND REPORTS.

Telegraphic record, ———, 187—, ———m.

Report from station.	Office received from.	Time received.	Sending operator.	Receiving operator.	Number words regular report.	Number words late report.	Time occupied.	Explanations.
25								
24								
22								
23								
21								
20								
30								
42								
44								
18								
17								
54								
12								
13								
14								
15								
27								
22								
29								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
43								
45								
46								
48								
49								
50								
51								
52								
53								
55								
62								
63								
65								
66								
67								
68								
70								

1
2
3
4
5

PAPER 57.—FORM 17.

Detailed synopsis and probabilities.

For—					
Barometer.	Thermometer.	Winds.	Weather.	Humidity, per cent.	Rain.

For—			Signals.
Barometer.	Thermometer.	Winds.	Weather.
			S—stationary. Fg—falling. Fx—fallen. Rg—rising. Rx—risen. D—denotes that rains fell during the day. E—denotes that rains fell during the evening. N—denotes that rains fell during the night. I—safety. W—warning.

PAPER 35.—FORM 19.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Station No. _____ Error Sheet for week ending _____, 187.

Date.	Time.	Reports missing at closing of circuits.	REPORTS RECEIVED AFTER THE SCHEDULE TIME.				Remarks.	No. words received.
			A. M. reports.	P. M. reports.	M. reports.	Time received.		
Sunday	A. M.							
	P. M.							
Monday	M.							
	A. M.							
Tuesday	P. M.							
	M.							
Wednesday	A. M.							
	P. M.							
Thursday	M.							
	A. M.							
Friday	P. M.							
	M.							
Saturday	A. M.							
	P. M.							
	M.							

Total number of words,

Observed.

NOTE.—Stations will be designated by their official numbers. Morning reports will be counted as words each; P. M. and M. reports 12 words each. Duplicates and corrections not to be counted.

PAPER 59.—FORM 20.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEROGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.
Station _____, week ending _____, 187—.

Original reading of barometer.	Reading of attached thermometer.	Correction for tem- perature.	Elevation of barome- ter above sea level.	Reading of exposed thermometer.	Correction for eleva- tion.	Instrumental error.	Corrected barometer.	RELATIVE HUMIDITY.			
								Dry bulb ther- mometer.	Wet bulb ther- mometer.	Difference.	Humidity.

Observer, Signal Service, United States Army.

Signals.

[illegible]

REPORT OF THE SECRETARY OF WAR.

PAPER 60.—FORM 21.

WAR DEPARTMENT, SIGNAL SERVICE. UNITED STATES ARMY.
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

List of stations, with their telegraphic numbers.

Station.	No.	Station.	No.	Station.	No.
Plaister Cove N. S.	10	Pittsburgh Pa.	41	Shreveport La	73
Saint Johns N. B.	11	Knoxville Tenn	42	Jacksonville Fla.	74
Portland Me.	12	Indianapolis Ind.	43	Portland Oreg.	75
Boston Mass.	13	Lynchburg Va.	44	San Diego Cal.	76
New London Conn.	14	Burlington Vt.	45		
New York City N. Y.	15	Mount Washington N. H.	46		
Albany N. Y.	16	Keokuk Iowa	47		
Philadelphia Pa.	17	Grand Haven Mich.	48		
Baltimore Md.	18	Escanaba Mich.	49		
Washington D. C.	19	Marquette Mich.	50		
Wilmington N. C.	20	Davenport Iowa	51		
Charleston S. C.	21	Leavenworth Kans.	52		
Savannah Ga.	22	Cairo Ill.	53		
Augusta Ga.	23	Cape May N. J.	54		
Lake City Fla.	24	Galveston Tex.	55		
Key West Fla.	25	Montreal Canada	56		
Montgomery Ala.	26		57		
Mobile Ala.	27		58		
New Orleans La.	28	Punta Rassa Fla.	59		
San Francisco Cal.	29		60		
Norfolk Va.	30	Vicksburgh Miss.	61		
Oswego N. Y.	31	Memphis Tenn.	62		
Rochester N. Y.	32	Nashville Tenn.	63		
Buffalo N. Y.	33	Louisville Ky.	64		
Cleveland Ohio.	34	Cincinnati Ohio.	65		
Toledo Ohio.	35	Saint Louis Mo.	66		
Detroit Mich.	36	Omaha Nebr.	67		
Chicago Ill.	37	Cheyenne Wyo.	68		
Milwaukee Wis.	38	Santa Fé N. M.	69		
Saint Paul Minn.	39	Corinne Utah.	70		
Du Luth Minn.	40	Fort Benton Mont.	71		

PAPER 61.—FORM 22.

WAR DEPARTMENT, SIGNAL SERVICE, UNITED STATES ARMY,
DIVISION OF TELEGRAMS AND REPORTS FOR THE BENEFIT OF COMMERCE.

Table showing daily and monthly mean of barometer and thermometer, monthly velocity of wind and amount of rain-fall, with the prevailing direction of wind for the month of _____, 187-.

Date.	Mean daily barometer.	Mean daily thermometer.	Rain-fall.	Remarks.
Monthly mean				
Total rain-fall				
Prevailing wind				
Total number of miles traveled				

421

[illegible]

PAPER 63.—FORM 24.

Record of bulletins, maps, and press-reports issued during the week ending —, 187-, at —.

Day.	NUMBER OF BULLETINS.			NUMBER OF MAPS.	NUMBER OF PRESS-REPORTS.			Remarks.
	Morning.	Afternoon.	Midnight.		Morning.	Afternoon.	Midnight.	
Sunday								
Monday....								
Tuesday ...								
Wednesday								
Thursday..								
Friday.....								
Saturday..								
Total...								

_____, Observer.

UNITED STATES MILITARY ACADEMY.

REPORT

OF THE

SUPERINTENDENT OF U. S. MILITARY ACADEMY.

HEADQUARTERS UNITED STATES MILITARY ACADEMY,
West Point, New York, November 14, 1871.

SIR: In compliance with your letter of the 7th instant, received on the 11th, I have the honor to forward the following brief report of affairs at the Military Academy for the past year, and of the informal character authorized by the letter.

The report is not so comprehensive or so much in detail as could be desired, but as much so as I have, in the short time taken, been able to make it.

First. For a report as to *personnel* of the Academy, attention is invited to the tabular statement annexed.

Second. Public buildings and improvements.

The public buildings are generally in a good state as to repairs. The sum asked for in the estimate forwarded in September last will meet all requirements for repairs.

The repairs to the cadet barracks are completed.

The new fire-proof building for records and offices is substantially finished. No further appropriation will be necessary on this account. The roads and grounds are in good condition. The south wharf, of which the covering is beginning to decay, will require new planking by the time the appropriation asked for on that account shall be available.

Whatever improvements are made should be on a comprehensive plan and with a view to future necessities.

The following improvements should, I think, be made so soon as can consistently be effected. Most, of course, I have no expectation will be soon seriously considered, and are only indicated as showing what I think should be had in view relative to future estimates.

Under the present system of appropriations, by which unexpended balances revert to the Treasury, and the means at disposal here for economical use of labor, but one or two works of much magnitude can be suitably prosecuted at the same time. In my estimate forwarded in September, owing to my limited experience here and for certainty as to necessities, I confined the estimate to the usual current and ordinary items and such incidental and miscellaneous items as usual or of apparent necessity. Such estimate I hope will meet approval.

IMPROVEMENTS.

A system of sewerage should be completed as soon as appropriations can be had. The estimate for coming year contains an item for survey and estimate for sewers.

A few years would suffice without requiring any large appropriation. The hospital reports show an apparent good sanitary condition, but it

cannot be expected to continue indefinitely under the present system of cesspools and surface-drainage.

The present academic building should be made fire-proof. This building contains nearly all the valuable collections and appliances of the different departments of instruction.

A cavalry barracks should be built near the present cavalry stable. The barrack now used by the cavalry detachment would then no more than supply quarters for enlisted men, who have been permitted to sleep off the post for want of quarters.

The present gas-works are not of sufficient capacity, and will require replacing or enlarging within a few years. An appropriation for this purpose, made in 1868, lapsed into the Treasury under the act of July, 1870.

A suitable carpenter-shop and a blacksmith-shop, to replace the temporary structures, which are little more than sheds, now used, should be built as soon as convenient.

A store-house for coal is necessary, an estimate for which is included in estimates made in September last. In the same estimate is included amount necessary to build an ice-house for preservation of perishable stores, in warm weather, for the cadets' mess.

There are many small wooden buildings in the quarter of the post commonly called Camptown, used mostly as quarters for enlisted men who are married. These buildings are mostly old, and will become, in a few years, unfit for use. It will, for reasons of ultimate economy in the comparatively less expenditure necessary for repairs, police, discipline, and better sanitary conditions that can be attained, be best, in place of rebuilding and keeping in repair so many small buildings, to build, from time to time, as may be necessary, suitable permanent buildings. The cost will be less in the end, and the conditions for police, &c., will be much improved.

The water-supply the summer before the past was not adequate. An appropriation for survey and estimate for bringing water from Long Pond, four miles distant, is now on hand. No survey has yet been made. It is certain that the cost of bringing water from Long Pond would be large. A sufficient supply, from means within present control, can, I think, be had on the reservation, certainly for all uses except for flushing sewers. For sewers, when constructed, water could, if found necessary, be pumped from the river at no more expense than would be required to pump water from Long Pond over an intervening ridge of fifty or more feet, as would be necessary. It may eventually be necessary to bring water from Long Pond, but there seems no present necessity.

The chapel is too small for accommodation of cadets and visitors and others who at times attend. Should a new chapel be built, the present building could, with little expense, be fitted for other necessary uses.

For most of the improvements mentioned special appropriations would of course be necessary. Should the amount asked for the next fiscal year for repairs and improvements (the same granted for the present year) be continued for several years, considerable could be done from this source. The necessary shops might be erected, the system of sewerage gradually carried out, and the wooden buildings in Camptown be gradually replaced by permanent buildings.

With reference to the public property I would respectfully invite attention to the necessity for a good steam fire-engine in place of the one now here. There should, owing to the distances between parts of the post, be two engines, one to be kept near the barrack for enlisted

men below the hill, and one at the cadet-barrack engine-room. Requisition for money on the Quartermaster's Department, for purchase of such engines, was forwarded a few days since.

THE DEPARTMENTS OF INSTRUCTION.

The philosophical department is not fully up in appliances with the present condition of the science. The defect will, to some extent, be remedied if estimates for that purpose presented are granted. Estimates for necessary models and apparatus will be asked for as shall be expedient. The professor of this department will need no urging to make it all that is desirable in respect to appliances.

The observatory, in addition to its use in the instruction of cadets, and for such work as the professor and instructors can find time for, independent of their duties, could, without interfering in any way with the instruction of cadets, be used if officers could be detailed, say young officers of engineers, in connection with their tour of duty with the engineers, battalion, and school, for making and recording continued observations.

THE DEPARTMENT OF ENGINEERING.

In this department some suggestions will, so soon as the professor recently appointed has time to fully consider the requirements of his department, be presented for consideration of the Secretary of War. Professor Mahan, previous to his death, was engaged on a revision of his Civil Engineering, used as a text-book. Such revision is necessary, and will be completed by Professor Wheeler. The instruction in military engineering, particularly of practical engineering, can be made of more practical value and more thorough than has recently been the case. Attention in connection with this department is invited to remarks on that of drawing.

THE DEPARTMENT OF LAW AND ETHICS.

The professor of this department, as now provided by statute, is also chaplain of the Academy.

Better results would, I believe, be attained if the chaplaincy were severed from a professorship. In such case the pay of chaplain should be made sufficient to insure a man of ability as chaplain. It would be best, also, that the position be not necessarily permanent.

THE DEPARTMENT OF DRAWING.

It is my opinion that the department of drawing, as such, should cease with the functions of the present professor. Consistently with other requisites to the education of an officer, to learn indifferently to execute pencil-sketches and water-colors, which is the general result attained, is not commensurate with the time required therefor.

All the drawing necessary to an officer's education can be taught in connection with the course of engineering, as is now nearly the case, with the exception of topography. Some time would then be disposable for more necessary instruction.

DEPARTMENT OF SPANISH.

The time now allotted to this study is not sufficient for thorough instruction. There seems to be no more time than can well be assigned.

The study of Spanish is of practical value to our Army, but I believe that of "English studies" to be more so, and if it is a question of choice, English studies, at least grammar, including composition and geography, should have preference over Spanish.

The question whether English studies, at least English grammar, including composition and geography, shall form part of the course of instruction, I think worthy the careful consideration of the Secretary of War. I believe it should form part of the course, even if place has to be made at the expense of other branches. Such course could be assigned to the professorship of law and ethics without overburdening that department. The results, so far as I have been able to learn from observation and inquiry, hoped to be attained by raising the standard for admission, particularly for English grammar, geography, and history, in which candidates admitted are supposed, practicably at least, to be qualified, have not been realized.

The following table shows the number of rejected candidates for five years, including the present, with percent. of rejected to whole number nearly enough for any inference pertinent.

	1867.	1868.	1869.	1870.	1871.	Total.
Arithmetic	6	16	9	29	15	75
Grammar	9	24	16	55	24	128
Geography	6	15	13	44	15	95
History	10	18	13	40	22	103
Reading	2	8	4	16	3	33
Writing	15	12	13	31	10	71
Orthography	10	12	13	31	10	76

Percentage of appointments rejected by academic and medical boards, (no great proportion due to medical rejections:)

1867	23.16
1868	29.13
1869	27.92
1870	50.00
1871	35.34

It would ordinarily be supposed from the relatively large number of rejections for deficiency in grammar and history, that not only a good degree of proficiency in those branches had been attained by those accepted, but that a corresponding greater degree of attainment in other elementary branches would result. But such in fact is not the case. Practically, to require proficiency in English grammar of candidates, would result in the rejection of much the greater portion. Such was the case as to the candidates examined in September last, (I was present at the examination,) and from what I learn is usually the case. As a practical question, a very indifferent knowledge of elementary English branches must be accepted as a necessary qualification to an officer's education, or else such studies should constitute part of the course of instruction.

Competitive examinations and appointments for some time beforehand, as now for the greater portion of classes is the case, will have some beneficial effect, but not essentially meet the case.

To many the year's preparation only enables them to gain admittance under the present standard.

The degree of studiousness of cadets is fair, and, if anything, improving.

The sanitary condition is good.

Police of the post is good.

DISCIPLINE.

The general conduct of cadets is commendable, so far as I am able to judge from the short time I have been on duty. There is, however, apparently, more carelessness with regard to observance of regulations than should be the case.

This, I think, can be easily corrected, and good results otherwise had from a reasonably strict adherence to the regulations of the Academy regarding demerit.

Recent action in regard to cadets engaged in interfering with new cadets will have a very salutary effect.

In this connection I would suggest the propriety of legislation authorizing, subject to control of the Secretary of War, the superintendent of the Academy to order courts-martial, having all powers of a general court except sentence of dismissal, the proceedings to be complete with the approval of the superintendent, subject, of course, to revision by the Secretary of War.

The promptness with which offenses not of the gravest character could be dealt with would have a good effect, and as much from the knowledge that such power pertained to the authorities of the Academy as from its actual exercise.

REVISION OF THE REGULATIONS OF THE ACADEMY.

A revision of the regulations is desirable. Should it meet approval I would like to submit suggestions relative to such revision, but would prefer not to do so, unless necessary, for some months to come. If there is probability of any legislation likely to affect the regulations, it would be well, on that account, to delay until after the coming session of Congress.

MISCELLANEOUS.

First. I would respectfully invite attention to the propriety of *requiring* a deposit with the treasurer of the Academy from candidates for admission of one hundred dollars. The accounts show that cadets who leave the Academy before the close of the first year after admission, who make a less deposit, usually leave more or less indebted. It has been customary to date discharges of those found deficient in studies sufficiently far ahead to cover indebtedness, otherwise the loss to the cadet commissary department and cadet mess would be so considerable as to require an increase of prices to all cadets to cover the loss.

Second. By the law now in force, the appropriation for expenses of the board of visitors is for board and lodging.

By an examination of accounts it appears that the actual cost is at about the rate of nine dollars per day while in attendance here, and eight cents a mile mileage to each member. The law in force was so worded, I suppose, on the supposition that compensation as such should not be paid members of the board of visitors. A per diem allowance would remove any doubt as to what should be included under the head of board. The construction has necessarily been rather liberal.

Third. I would invite attention to the subject of compensation to cadets, mostly of the present third class, for losses by the fire at the cadet barracks last winter. Such losses occurred while the sufferers were engaged under their officers in efforts to extinguish the fire. Compensation, if made, should, I think, be confined to articles obtained from the cadet commissary, clothing and books.

The proof as to articles would be, for the most part, the affidavits of the cadets concerned; the values could be fixed by the cadet commissary prices. I will forward statement of names and amounts as to individuals in a few days; the whole amount of loss, of the character specified, would be about \$5,000, I think.

Very respectfully, your obedient servant,

THOS. H. RUGER,

Colonel Eighteenth Infantry, Superintendent.

The Honorable the SECRETARY OF WAR,

Washington, D. C.

OFFICERS AND PROFESSORS OF THE UNITED STATES MILITARY ACADEMY.

Professors.....	5
Surgeon and assistant surgeon.....	2
Commissioned officers.....	34
Sword-master.....	1
Strength July 1, 1870.....	45

CASUALTIES.

From 1st July, 1870, to 1st July, 1871:

Resigned.....	2		
Died, (Major Edson, November 17, 1870, and Professor Agnel, February 10, 1871).....	2		
Discharged.....	1		
Transferred (relieved).....	9		
Retired.....	2		
	16 loss	29	
Joined by appointment, (Professors Michie and Andrews).....	2		
Joined by transfer.....	12		
	14 gain	14	
Strength 1st July, 1871.....			43

From 1st July, 1871, to 30th October, 1871:

Resigned.....	0		
Died, (Professor French, July 8, 1871, and Professor Mahan, September 16, 1871).....	2		
Discharged.....	0		
Transferred.....	12		
Retired.....	0		
	14 loss	29	
Joined by appointment, (Professors Forsyth and Wheeler).....	2		
Joined by transfer.....	13		
	15 gain	15	
Strength 30th October, 1871.....			44

CADETS UNITED STATES MILITARY ACADEMY.

Strength 1st July, 1870, (first, second, and third classes).....	165
Admitted 1st July, 1870.....	37
Strength 1st July, 1870.....	202
Admitted 1st September, 1870.....	28
Restored 1st September, 1870 (Rucker).....	1
	— 29 gain 29
Strength 1st September, 1870.....	231

CASUALTIES.

From 1st July, 1870, to 1st July, 1871:

Resigned	13		
Died	0		
Discharged	8		
Dismissed	5		
Deserted	1		
Graduated	42		
		— 69 loss	69

Strength 30th June, 1871.....

Admitted 1st July, 1871.....	60		162
Restored 1st July, 1871.....	7		
		— 67 gain	67

Strength 1st July, 1871.....229

From 1st July, 1871, to 1st September, 1871:

Resigned, (Yeomans, August 30, 1871).....	1		
		— 1 loss	228
Admitted 1st September, 1871.....	16		
Restored, (Goodwin, 4th September, 1871).....	1		
		— 17 gain	17

Strength 1st September, 1871.....245

From 1st September to 30th October, 1871:

Dismissed	4		
		— 4 loss	4

Strength 30th October, 1871.....241Number of cadet vacancies, (congressional,) October 30, 1871.....45

STATEMENT OF FUNDS FOR THE YEAR BEGINNING JULY 1, 1871.

September 1, received from Colonel T. G. Pitcher.....	\$63,450 00
In Treasury of the United States	66,000 00
Available September 1	129,450 00
Expended, to include November 10.....	37,725 80
	<u>91,724 20</u>
In Treasury of the United States	\$55,000 00
On deposit with assistant treasurer, New York	36,724 20
	<u>91,724 20</u>
July 1, available in hands of superintendent	\$80,423 24
Appropriations.....	87,494 00
	<u>167,917 24</u>
November 10, expended to date.....	76,193 04
	<u>91,724 20</u>

OFFICERS OF THE MILITARY ACADEMY.

SUPERINTENDENT.

Colonel THOMAS G. PITCHER, *First Infantry.*

MILITARY STAFF.

Captain EDWARD C. BOYNTON, A. M., *Third Artillery, Adjutant.*
 Captain TULLY MCCREA, *First Artillery, Quartermaster.*
 First Lieut. JAMES M. MARSHALL, *Fourth Artillery, Treasurer.*
 Major THOMAS A. McPARLIN, M. D., *Surgeon U. S. A.*
 Captain VAN BUREN HUBBARD, M. D., *Assistant Surgeon U. S. A.*

ACADEMIC STAFF.

Lieut. Col. EMORY UPTON, 1st Artillery,	}	<i>Commandant of Cadets and Instructor of ARTIL- LERY, CAVALRY, AND INFANTRY TACTICS.</i>
Captain ALEXANDER PIPER, 3d Artillery,	}	<i>Assistant Instructor of Artillery Tactics.</i>
Captain JOSEPH S. CONRAD, 2d Infantry,	}	<i>Assistant Instructor of Infantry Tactics.</i>
Captain ALEXANDER S. CLARKE, 5th Cavalry,	}	<i>Assistant Instructor of Infantry Tactics.</i>
Captain ALFRED E. BATES, 2d Cavalry,	}	<i>Assistant Instructor of Cavalry Tactics.</i>
1st Lieut. WILLIAM S. STARRING, 2d Artillery,	}	<i>Assistant Instructor of Infantry Tactics.</i>
1st Lieut. CHARLES KING, 5th Cavalry,	}	<i>Assistant Instructor of Infantry, Artillery, and Cavalry Tactics.</i>
Bvt. 2d Lieut. EDGAR W. BASS, Engineers,	}	<i>Acting Assistant Professors of Natural and Experi- mental Philosophy.</i>
Bvt. 2d Lt. WILLIAM L. MARSHALL, Engineers,		
GEORGE L. ANDREWS <i>Professor of the FRENCH LANGUAGE.</i>		
1st Lieut. GEORGE G. GREENOUGH, 4th Artillery,	}	<i>Assistant Professor of the French Language.</i>
2d Lieut. THOMAS H. BARBER, 1st Artillery,	}	<i>Acting Assistant Professors of the French Lan- guage.</i>
Cadet JAMES R. WASSON, U. S. M. A.		
Cadet Andrew H. Russell, U. S. M. A.		
Capt. THOMAS C. BRADFORD Ordnance,	}	<i>Instructor of ORDNANCE AND GUNNERY.</i>

- 1st Lieut. EDWARD H. TOTTEN, } *Assistant Instructor of Military Signaling and Tele-*
1st Artillery, } *graphy, and Acting Signal Officer.*
- 1st Lieut. JOHN C. MALLERY, } *Commanding Company F, Engineers.*
Engineers, }
- 2d Lieut. FREDERICK A. MAHAN, } *On duty with Company E, Engineers.*
Engineers, }
- ANTONÉ LORENTZ *SWORD-MASTER.*
- DENNIS H. MAHAN, LL. D. *Professor of MILITARY AND CIVIL ENGINEERING.*
- Captain GARRETT J. LYDECKER, } *Assistant Professor of Military and Civil Engineering.*
Engineers, }
- 1st Lieut. JOHN C. MALLERY, } *Acting Assistant Professor of Military and Civil*
Engineers, } *Engineering.*
- ALBERT E. CHURCH, LL. D. *Professor of MATHEMATICS.*
- Captain HERBERT A. HASCALL, } *Assistant Professor of Mathematics.*
5th Artillery, }
- 1st Lieut. JAMES C. POST, }
Engineers, }
2d Lieut. JOHN E. GREER, }
Ordnance, }
2d Lieut. WILLIAM F. REYNOLDS, } *Acting Assistant Professors of Mathematics.*
1st Artillery, }
2d Lieut. ALBERT H. PAYSON, }
Engineers, }
2d Lieut. PHILIP M. PRICE, Jr., }
2d Artillery, }
- ROBERT W. WEIR, N. A. *Professor of DRAWING.*
- 1st Lieut. EDWARD H. TOTTEN, } *Assistant Professor of Drawing.*
1st Artillery, }
- 1st Lieut. RICHARD C. CHURCHILL, } *Acting Assistant Professor of Drawing.*
4th Artillery, }
- Rev. JOHN W. FRENCH, D. D. *Chaplain and Professor of ETHICS AND LAW.*
- 1st Lieut. JOHN P. STORY, } *Assistant Professor of Ethics and Law.*
4th Artillery, }
- HENRY L. KENDRICK, LL. D. *Professor of CHEMISTRY, MINERALOGY, AND*
GEOLOGY.
- 2d Lieut. JOHN PITMAN, } *Assistant Professor of Chemistry, Mineralogy, and*
Ordnance, } *Geology.*
- 2d Lieut. SAMUEL E. TILMAN, } *Acting Assistant Professor of Chemistry, Mineralogy,*
4th Artillery, } *and Geology.*
- PATRICE DE JÁNON *Professor of the SPANISH LANGUAGE.*
- 1st Lieut. JAMES O'HARA, } *Assistant Professor of the Spanish Language.*
3d Artillery, }
- PETER S. MICHIE } *Professor of NATURAL AND EXPERIMENTAL PHI-*
LOSOPHY.
- First Lieut. JAMES MERCUR, } *Assistant Professor of Natural and Experimental*
Engineers, } *Philosophy.*

MEMBERS OF THE BOARD OF VISITORS.

Appointed by the President.

Rev. BYRON SUNDERLAND, D. D., (President,) District of Columbia.
Professor ISAAC F. QUIMBY, (Secretary,) New York.
Hon. WILLIAM AIKEN, South Carolina.
Hon. A. G. EDWARDS, Missouri.
Hon. J. NEELY JOHNSON, Nevada.
Hon. WILLIAM MILLER, Alabama.
JOSEPH J. WOODS, Colonel Twelfth Iowa Volunteers, Kansas.

Appointed by the President of the Senate.

Hon. MATT. H. CARPENTER, United States Senator from Wisconsin.
Hon. O. P. MORTON, United States Senator from Indiana.

Appointed by the Speaker of the House of Representatives.

Hon. JOHN B. HAWLEY, Representative from Illinois.
Hon. SAMUEL S. BURDETT, Representative from Missouri.
Hon. LEWIS D. CAMPBELL, Representative from Ohio.

EXTRACT FROM ACT OF CONGRESS APPROVED AUGUST 8, 1846, AMENDED BY ACTS OF
MARCH 16, 1868, AND FEBRUARY 21, 1870.

That the President be authorized to appoint a Board of Visitors to attend the annual examination of the Military Academy, whose duty it shall be to report to the Secretary of War, for the information of Congress, at the commencement of the next succeeding session, the actual state of the discipline, instruction, police, administration, fiscal affairs, and other concerns of the institution: *Provided*, That the whole number of visitors each year shall not exceed seven: *Provided further*, That no compensation shall be made to said members beyond the payment of their expenses for board and lodging while at the Military Academy, and an allowance, not to exceed eight cents per mile, for traveling by the shortest mail route from their respective homes to the Academy, and back to their homes. And in addition to the other members of the Board of Visitors to be appointed by the President, according to law, to attend the annual examination of cadets at the United States Military Academy, there shall be on every such board two Senators, to be designated by the Vice-President, or President *pro tempore* of the Senate; and three members of the House of Representatives, to be designated by the Speaker of the House of Representatives, such designations respectively to be made at the session of Congress next preceding the time of such examination; and the Senators and Members so appointed shall make full report of their action as such visitors, with their views and recommendations in regard to the said Military Academy, within twenty days after the meeting of Congress, at the session next succeeding the time of their appointment.

REPORT OF THE BOARD OF VISITORS.

WASHINGTON, *July 1, 1871.*

SIR: It is proper, in transmitting to you the accompanying report of the Board of Visitors to the Military Academy for the present year, that we should explain the fact that only seven members of the board have affixed to it their signatures.

At the conclusion of our labors, several members of the board were absent. The Hon. L. D. Campbell, of the House of Representatives, was not at any time in attendance. His colleagues, the Hon. Mr. Hawley and the Hon. Mr. Burdett, and likewise the Hon. O. P. Morton of the United States Senate, were unable to remain until the close. General Quimby, the secretary of the board, was suddenly summoned from its sessions by serious illness in his family. The voluminous testimony taken by the committee on the subject of discipline requiring the service of a stenographer, could not be prepared in time to be submitted to the board before its final adjournment. This testimony has been sent by our direction to Senator Carpenter, the chairman of said committee.

The members of the board representing the Senate and House will doubtless, in performance of their further duty, make a report to Congress and present the testimony upon this subject.

Of the seven remaining members of the board, only four, as you will perceive, affixed their signatures to the report without qualification. The minority did not deem it advisable to draw up a separate report upon the topics which divided them from the majority, but have been content for the present to except to the portions indicated opposite their names.

We sincerely regret the want of unanimity in our conclusions, and all the more so, since our personal relations were throughout so full of pleasure and our parting one of unfeigned mutual respect.

But if the unanimity of former years is wanting to this report, you will do us the justice to believe that we have each been actuated by independence of thought and honesty of conviction.

Most respectfully, your obedient servant,

B. SUNDERLAND,
President of the Board.

Hon. WILLIAM W. BELKNAP,
Secretary of War.

WEST POINT, *June, 1871.*

SIR: The Board of Visitors to the United States Military Academy at West Point, New York, for 1871, have the honor herewith to submit their report.

The board met at the time and place designated, and, being duly organized, entered upon their labors. They were first introduced by the Superintendent, Brevet Brigadier General Thomas G. Pitcher, to the academic board, and received with the customary formalities. They

were daily furnished with aids, and advised of the order of exercises. All parts of the post were thrown open to their inspection. Every facility was afforded and every attention was paid to them in the progress of their investigations.

EXAMINATIONS.

The candidates for admission to the Academy were first examined. This being a change from the previous practice, the board were invited to witness the ordeal. Proficiency in reading, writing, spelling, grammar, arithmetic, geography, and the history of our country is required to qualify for admission. The result showed that out of ninety examined, ten were rejected for physical disability, and twenty-two for defectiveness of scholarship. (See Appendix, Exhibit No. 1.)

The examination of the first class, consisting of forty-three members, was continued for several successive days, and covered the principal topics of the last academic year. The discussions and answers in military and civil engineering, in military and international law, in mineralogy and geology, in ordnance and gunnery, and in cavalry tactics, fully evinced the attainments of the graduating class in these branches of study.

The second class, numbering sixty members, was examined in philosophy, chemistry, infantry tactics, artillery tactics, and drawing.

The third class, numbering fifty-one members, was examined in mathematics, French, Spanish, and drawing.

The fourth class, numbering fifty-five members, was examined in mathematics and French.

The acquirements of the young gentlemen in each of these classes, in their respective studies, so far as the board had opportunity to judge of them, were generally commendable.

Each cadet is examined upon two topics, one by illustrations upon the blackboard, the other by questions from the professor. In the case of the three lower classes, the interest is divided between two simultaneous examinations before respective subdivisions of the academic board. This requires either a corresponding division of the Board of Visitors, or an alternation between the two centers of attraction, which is not wholly satisfactory. In the opinion of the board, the examination should be conducted in the presence of the whole military and academic staff and of the assembled spectators. The requisite additional time might well be occupied, in view of the obvious advantage.

MILITARY EXERCISES.

The board were fortunate in witnessing the out-door exercises, some one of which was given each day, through a period of weather unusually propitious. These exercises consisted of the battalion, skirmishing, light artillery, siege artillery, sea-coast artillery, pontoon, and squadron drills, together with practical duties in the laboratory, military signaling and telegraphy, and the use of the sword and bayonet. The exercise of the evening, mortar drill and the several exhibitions of pyrotechnics, all of which were quite superior, elicited the warmest commendation.

GRADUATION CEREMONIES.

On Monday, June 12, the board attended at the chapel on the interesting occasion when the diplomas were awarded to the graduating class by Major General George G. Meade, in the presence of the President of

the United States, of the Board of Visitors, of the military and academic staffs, of the corps of cadets, and a large concourse of spectators. Senator Carpenter, a member of the board, delivered an address, and the imposing ceremony, enlivened by the stirring music of the well-appointed and efficient band of the post, was concluded by the singing of the usual parting hymn and the benediction.

RELIGIOUS SERVICES.

During their sojourn at the post, the board attended the public religious services, which are held in the chapel at half past ten o'clock every Sabbath morning, where all the officers and men, unless absent on duty, or attending religious services elsewhere, are required to be present.

The physical infirmities of the chaplain permanently disabling him for duty, his place during the past year has been supplied by such clergymen as could be secured from time to time. These services were conducted by the president of the board on two successive Sabbaths.

A second service is generally held in the afternoon, attendance upon which is entirely voluntary. Other religious meetings are quietly but earnestly maintained among a portion of the cadets themselves. And thus is furnished a gratifying evidence of the respect paid by all to the ordinances, and of the value set by many on the influence of the Christian religion.

THE CHAPLAINCY.

In connection with the chapel service, the board urgently recommend that henceforth the office of chaplain be made distinct; that the term of incumbency be limited to four years; and, as far as practicable, that the religious denominations be represented in rotation, in order that the principle so wisely adopted by the founders of the republic, and working so prosperously throughout the country, may be practically recognized at this post—that is to say, no monopoly of political patronage; no ecclesiastical establishment; no union of church and state.

THE COURSE OF INSTRUCTION.

The board have carefully considered the entire course of studies pursued at the Academy, both as to the methods of instruction, the nature of the branches pursued, and the time respectively given to each.

With regard to the *methods* of teaching in all the departments, they are able to express an almost unqualified approbation. The processes of imparting a knowledge of the subjects under discussion, seem skillfully chosen to reach the highest intelligence and culture, not so much by crowding the mind with the mere material of learning, as by training it to clear and consecutive thinking, or, in other words, teaching the art of study.

But in reference to the subjects pursued and the relative time devoted, the board respectfully suggest that an important change is imperatively demanded. In fact, considering the advanced conditions of science and civilization at the present day, it is, in the opinion of the board, absolutely indispensable to the future greater efficiency of the institution.

The four years of the academic course, as found by universal experience, constitute the maximum of time proper to be spent in the acquisition of a fundamental education, whether in the science of arms or in the liberal professions of civil life. Those studies which are essential to a military training, with those which are more closely akin to them, es-

pecially in view of the great expansion and minute accuracy of modern investigation, must of necessity consume the whole period of the academic curriculum. It has consequently been found that a number of most important branches, particularly those of elocution, English literature, belles-lettres, and ethics, have been thrust aside simply for want of time.

Furthermore, in view of the increasing intimacy of our country with Spanish-speaking populations, the board have been impressed with the conviction that the necessity of a knowledge of this language is not sufficiently understood. When it is remembered that the Spanish is spoken by forty-five millions of people, more than half of whom compose nations in our own hemisphere, and are annually coming into closer connection with us; when it is apparent that every year is extending and complicating our commercial and civil relations; when we consider the influence of future diplomatic intercourse, and even the possibility of military operations, we can scarcely overestimate the value of this study to the young men of the Academy. While, therefore, the board would gladly urge attention to other modern languages, as the French and German, so far as may be practicable, they deem it indispensable that the Spanish should be not only retained but even made more prominent.

PREPARATORY COURSE.

In the judgment of the board, strong reasons exist for the change they would propose. In the first place, candidates should have every possible advantage for admission to the institution; and while the examinations are fairly conducted, the terms are already as low as can well consist with the higher attainments of the subsequent course, and at the same time with the general preparations of young men for such admission. In the second place, it is to be deeply regretted that no provision has yet been made for the proficiency of the cadet in those studies which are now wholly excluded, and without a knowledge of which no man can be said to be thoroughly educated and fitted for the wider and more solemn duties of after-life.

The board, therefore, earnestly recommend that a preparatory course of at least one year should be established, and, in view of the number of annual rejections, that the minimum age of admission to the Academy be fixed at eighteen years; that the method and standard of admission to the preparatory course be the same as it now is for the Academy; that at the end of this course an examination in the studies of the preparatory year be held, and that no person who cannot pass the test of such examination shall be admitted to the Academy, though he may not be required to pursue the prescribed studies with the preparatory class. And in pursuance of this end, the board likewise further recommend that a professorship of ethics and belles-lettres be established, the incumbent to be selected from civil life, and that the entire course of study be adjusted in accordance with the change proposed.

THE ACADEMIC BOARD.

The Board of Visitors for 1871, bear witness that in meeting the Superintendent and members of the military and academic staffs, they were brought into contact with gentlemen who are eminent each in his respective department. The only shadow of this reflection is that none, however useful or conspicuous, can avert the approach of inevitable change. A day must come when it is best that men should retire from

the station which they have both dignified and adorned. It is the conviction of the board that such period has arrived in the case of the professor of ethics and law, of the professor of engineering, and of the professor of drawing; and that the Government should afford ample provision for that comfort in their retirement, to which they are entitled by so long a life of active and distinguished public service. And the board would further recommend that the professorship of drawing be abolished, and that hereafter this study be included in the department of engineering, and at the same time restricted to mathematical and topographical drawing.

THE LIBRARY.

A collection of some 24,000 volumes constitutes the library of the Academy. The room is spacious and finely located for the purpose. The books are in good condition, and, considering the general design as rather for miscellaneous reference than for erudite and scholastic reading, they seem to be well selected, and the utility of the collection might be augmented by such annual increase as a liberal appropriation would afford.

THE APPARATUS AND OBSERVATORY.

The board were gratified to find ample provision of philosophical and chemical apparatus, and, at the same time, surprised that no suitable rooms have been provided for practical processes and experiments. On the other hand, while they were constrained to admire the splendid fixtures and mechanism of the observatory, they regret to see in the mounted telescope the inferiority of forty years ago, and they would respectfully suggest whether it is not expedient to supersede an instrument which is not equal to the present requirements, not worthy of the institution to which it belongs, and not creditable to the American people, whose pride it should be to make everything about this national school conform to the most advanced stages of science and discovery.

INSPECTION OF BUILDINGS.

The board had the opportunity of examining the buildings at the post with their appointments, in every detail of construction, and were gratified to find the principal structures cleanly, in good order, substantial, and convenient for their purposes, so far as their capacity will admit.

The chapel, while formerly answering all the purposes of its erection, has, of late years, become insufficient to accommodate the increasing numbers in attendance, and the board regard it highly important that none should be excluded from want of room.

The hospitals are both in position and furnishing all that can be desired, yet happily they are tenanted by few. For several months past they have sheltered but some half-dozen men, to whose necessities the Government ministers faithful medical attendance.

The board would respectfully urge the erection of suitable buildings for the philosophical and chemical apparatus, for military relics, trophies, models, and other objects of interest, which have already accumulated beyond the limit of proper accommodation.

The workshops stand in the most unattractive part of the locality, where, though convenient of access from the river, which is an important consideration, they are, nevertheless, surrounded by an almost unbroken wildness of nature, heaped with piles of rubbish. These shops are built chiefly of wood. They are much decayed, and altogether too

unsubstantial and precarious for the purposes to which they are devoted. It is clearly the conviction of the board that they should be replaced by others more spacious, permanent, and safe.

The works for the manufacture of gas are greatly in need of repair. Twenty thousand dollars once appropriated to this object has, by recent legislation, reverted to the Treasury.

The place for the deposition of the large quantities of coal annually used at the post is wholly unsuited, it being at the foot of a yard-wall, with no other protection or cover, and not only presenting an unsightly appearance, but also being liable to all the loss of such unnecessary exposure.

STATE OF THE GROUNDS.

With the exception of those portions which form the sites of the workshops, the grounds, including the plain, the encampment, the cemetery, the garden, together with the forts, the walks, the roads, the wharfs, and the water-courses, are in prime condition. The principal thing now required is a system of sewerage and drainage, which has never yet been adequately provided, and which, from the natural conformation of the place and the injury of heavy storms, is very greatly needed. It would prove the only effectual remedy against the large contingent expense for repairs of damage which now annually accrues.

FISCAL AFFAIRS.

The board have, by their committee, examined the books and accounts of the post, and found an exact and competent system of checks and balances, showing in every minute detail that the fiscal affairs of the institution are conducted with rigid economy and scrupulous honesty. The vouchers and evidences of all moneys received and expended are so exhibited as to afford full satisfaction. Statements of the accounts of all appropriations and expenditures, as furnished the board by the proper accounting officers, are herewith submitted. (See Appendix. Exhibits Nos. 2, 3, and 4.)

POLICE.

The board find the police regulations efficient and admirable, extending as they do to all the duties and responsibilities of military life, and to all parts of the grounds, walks, cemetery, garden, academic buildings, officers' houses, barracks, mess-hall, laundry, riding-hall, stables, and outbuildings. They impose at all times the strictest regimen. To the natural beauty and grandeur of the place are thus added the finishing attractions. The whole aspect and activity of the post, the neatness, order, and punctuality which mark the disposition of every article and the movements of every hour, attest, in the most striking manner, the completeness of a vigilance which stamps its impress on every hand. To this wise forecast, aided by the salubrity of nature and the protecting kindness of Providence, is due the sanitary condition of the post; the general health which prevails throughout the entire academic course.

ADMINISTRATION.

The Superintendent is charged with the administration of every department of duty and responsibility at the post, but he has generally been well sustained by his subordinates. The board are pleased to note the evidences of a wise and competent supervision of all that concerns the welfare of this community. Having some eight hundred souls

directly or remotely connected with his military family, the Superintendent has not only maintained a school for more than eighty children, but he has directed the various labors of the adults in every branch of industry, and caused to be kept an account of every dollar appropriated and expended; a record of every particular of the profit and loss of the institution. To his judgment and diligence very much is due for the charming appearance of the place, and the remarkable order in which everything is conducted. Alike in the greatest and the smallest matters, whether sanitary, economic, or educational, there seems to have been a spirit of fidelity and painstaking which cannot be too highly praised. Nothing appears to have been neglected which the means placed in his hands enabled him to supply.

In view, therefore, of the arduous and complicated labors of his position, the board freely accord their tribute of approbation to an officer who, having for several years sustained the burdens of his administration with so much fidelity and success, is about to be transferred to another post.

DISCIPLINE.

In regard to the discipline of the corps of cadets, the board have made such investigation and examination as circumstances have allowed, and have sought to compare its present with its former state. And while the board are compelled to express the opinion that the discipline now existing is not as strict as formerly, they feel that it would be unjust to charge upon the officers now in command at the Academy, a result which has been produced by many extraneous causes, and has been the growth of many years.

Twenty-five years ago West Point was substantially separate from the outside world; for several months of the year a mail was not received oftener than once in three or four days. The presence of visitors was almost wholly unknown, and the officers and cadets formed a community by and of themselves. The relations existing between the officers and cadets was like that at present existing between the officers and soldiers at a military post. Cadets were permitted to visit at the quarters of professors and officers on Saturday afternoons, and at no other time. But so reserved were the manners of officers, even on such occasions, that the privilege, though recognized, was very rarely exercised. There was substantially no social intercourse between the officers and the cadets.

In those days, too, the rigor of discipline put all cadets, the sons of the rich and the sons of the poor, upon a common footing. The regulations not only prohibited any cadet from receiving money from his parents and friends, but no place existed, or was permitted to exist, on the limits, where cadets could expend money. Occasionally a cadet was allowed to purchase what he pleased under the head of "sundries," not exceeding one dollar in amount, and that only on the order of an officer in charge.

But all this has changed. West Point is now or fast becoming a place of fashionable resort. Hotels have been erected in near proximity to the post, and hundreds of visitors now repair thither where one did in former years. This influx of fashionable life has caused a relaxation of the rules in regard to cadets visiting. The great distance between officers and cadets has been gradually diminished. Cadets of the first class may now visit officers every day in the week, and officers and cadets associate together with a freedom of intercourse not formerly known. Insensibly the standard of discipline has been lowered, until

the Academy has less than formerly the character of the Regular Army, and more the features of a militia establishment, where officers and men are separated while on duty, but mingle in social intercourse when the hour of drill or parade has passed.

Although the regulation in regard to cadets receiving money remains unchanged, yet, at present, a new functionary, known as the "cadet confectioner," is allowed to keep open on cadet limits a place of resort which cadets are known to frequent daily to enjoy the table, and where they may treat their fellows without stint or limit. Thus one of the elements of equality which formerly existed among the cadets is destroyed, and the son of a wealthy man may fare sumptuously, while the poor boy must confine himself to such food as the mess-hall affords.

Many other causes might be mentioned as contributing to the present condition of things, and many other illustrations of the change from the custom of former years might be given. But those members of the board who have been appointed by the Vice-President and Speaker of the House of Representatives, and whose duty it is by law specially made to report to Congress upon this subject, will doubtless do so at length, and therefore this board pass the subject without as full a consideration as would otherwise be demanded. But this board, feeling the importance of a high state of discipline to the efficiency of the Academy, to accomplish the purpose for which it is maintained, earnestly recommend a return to the stricter kind of discipline which was administered years ago. An army must be governed by different methods and upon different principles from a civil society, and to an army and to every military establishment discipline is a necessity.

With a view to this end, in the opinion of this board, the superintendent and commandant of cadets should always be officers of high rank, who, by their age and military distinction, can command not only the respect but the implicit obedience of the cadets.

RECOMMENDATIONS.

The board are not insensible to the delicacy of making recommendations which involve considerable drafts upon the Treasury of the country at a time when an enormous debt weighs it down, and the strictest economy should be the public policy. Yet, without doubt, it is the duty of Congress to make liberal provisions for this post, so long as the institution is maintained as the sole national military school. The board of the present year have endeavored to point out the most pressing necessities, and call to them the attention of the Government.

They would respectfully suggest that the amount which last year re-lapsed to the Treasury may be reappropriated, with such other sums as may be necessary to these important objects.

The board would also respectfully suggest that the loss of clothing and other articles of the cadets by the fire which occurred during the last winter, and which some of them can ill afford to bear, should be reimbursed by the generosity of the Government, inasmuch as the evidence in each case is clear and definite, and there are satisfactory vouchers for the full amount of loss sustained by each cadet.

CONCLUSION.

It remains only for the Board of Visitors for 1871, in taking leave of the subject of their investigations, to avow the sentiment of heart-felt pride which, upon the whole view of the case, they experience in regard to this great national military school. When we reflect on its historic

associations, on the number of its illustrious sons who have gone out to adorn every department of human enterprise, as well as to defend the country in times of peril; when we see the great benefits thus conferred on so many youths of the republic, and the necessity of the continuance of such an institution, not only for maintaining the national defense, but also for upholding the high standard of scientific attainments, there can be no question among the candid and patriotic as to the feasibility and the duty of giving it a prompt and generous support.

It must, indeed, expect to encounter the criticism and opposition of its enemies, and if these be wisely improved, they may be overruled for the still higher good to which it is reaching forward. The board have only to express the hope that the results of the past may be transcended by the achievements of the future, and that the Academy may flourish as one of the strongest and noblest monuments of the nation.

A. G. EDWARDS, *of Missouri.*

J. NEELY JOHNSON, *of Nevada.*

J. J. WOODS, *of Kansas.*

MATT. H. CARPENTER, *of Wisconsin.*

With the exception of the article on discipline.

B. SUNDERLAND, *of Washington, D. C.,*
President of the Board.

WM. MILLER, *of Tuscaloosa, Alabama.*

With the exception of the article on discipline, and also the article on the retirement of professors.

WILLIAM AIKEN, *of South Carolina.*

HON. WILLIAM W. BELKNAP,
United States Secretary of War.

EXHIBIT No. 1.

Statement showing the number of new cadets who have reported for examination, who have been rejected, and on what account, from 1867 to 1871, inclusive.

Years.	Number reported for examination.	Number rejected.	Rejected on what account.					
			Literary incompetency.					Physical disability.
			Writing, including orthography.	Reading.	Arithmetic.	Geography.	Grammar.	
1867	74	19	15	2	8	7	8	9
1868	113	37	12	8	16	15	25	19
1869	111	30	13	4	9	13	16	13
1870	144	78	31	16	29	44	56	40
1871	90	32	6	2	11	12	15	15
Total	532	196	77	32	73	91	120	46
								28

EDW'D C. BOYNTON,
Bvt. Major and Adjutant.

ADJUTANT'S OFFICE, U. S. MILITARY ACADEMY,
West Point, N. Y., June 10, 1871.

EXHIBIT No 2.

Statement of the moneys received and expended by the treasurer of the Military Academy on account of the cadets, for the year ending April 30, 1871.

Balance on hand May 1, 1870.....	\$11,253 66
Moneys deposited by cadets during the twelve months ending April 30, 1871.....	14,689 05
Equipment fund returned:	
Each cadet has \$4 a month withheld from his pay, and the whole amount returned to him when he graduates or is discharged.....	8,508 00
Traveling pay.....	641 71
Pay:	
Each cadet receives \$50 79 per month.....	132,054 76
Total receipts.....	167,146 18
Board:	
An auditing board examines the accounts of the purveyor every two months, and the whole amount is charged pro rata among the cadets.	\$50,471 01
Washing:	
Prices of washing for blankets, pants, coats, and jackets, 7 cents; shirts, drawers, sheets, &c., 5 cents; socks, gloves, belts, &c., 3 cents.	9,762 37
Store of commissary:	
Conducted by commissary of cadets; the articles supplied are uniform clothing and room furniture.....	20,349 20
Store of commissary, clothing department:	
Text-books, stationery, shoes, &c., and the necessary repairs to the same, all of which is subject to the inspection of the clothing board.	26,778 48
Store of commissary, shoe department.....	6,009 49
Postage.....	469 19
Barber and shoeblick:	
Each cadet is charged 38 cents per month for shoeblicking, 10 cents for hair-cutting, and 15 cents for varnishing accoutrements.....	1,812 64
Confectioner.....	212 00
Baths:	
Charged at 6 cents each.....	710 48
Making fires and policing barracks:	
Charged pro rata.....	1,116 61
Printing:	
For the use of cadets.....	311 31
Dialectic Society:	
Charged by subscription.....	261 59
Gas:	
Each cadet is charged 50 cents per month.....	1,297 50
Dentistry.....	1,197 27
Damages, Quartermaster's Department:	
Collected for damage to Government property, (broken windows, &c.)	31 20
Damages, ordnance, United States:	
Collected for damage to Government property, (guns, &c.).....	56 53
Damages, mess:	
Collected for damage at mess-hall, (broken dishes, &c.).....	150 81
Subscriptions to boat-clubs.....	894 18
Subscriptions to newspapers:	
One paper allowed to be taken by any cadet upon receiving the superintendent's permission.....	279 40
Subscriptions to theatricals:	
Entertainment given by the cadets on the evening of December 31...	118 30
Subscriptions to dancing:	
Paid dancing-master, &c.....	627 91
Subscriptions to invitation-cards:	
For hops, theatricals, &c.....	1,005 85
Subscriptions to hops:	
Necessary music, attendants, and incidental expenses.....	317 99
Subscriptions to albums:	
Allowed only to graduates just prior to their leaving.....	155 63

Subscriptions to monument:	
Subscribed	\$400 40
Subscriptions to lectures:	
Payment of lecturers, &c.	410 00
Subscriptions to cadet-band:	
For theatricals of December 31	56 75
Subscriptions to class-rings:	
Allowed only to graduates	689 00
Oath of allegiance:	
Notary's fees, 25 cents each	28 50
Freight:	
For cadets	3 52
Expressage:	
For cadets	188 51
Cash paid discharged and graduated cadets	24,671 32
Balance on hand April 30, 1871	6,013 24
Balance of equipment fund April 30, 1871, (amount collected during the year)	10,288 00
Total expenditures	167,146 18

EXHIBIT No. 3.

EQUIPMENT FUND.*

May 1st, 1870: By balance on hand	\$17,300 00	
Receipts for year ending April 30, 1871		10,288 00
Paid graduates, &c., for year ending April 30, 1871	\$8,508 00	
Balance on hand May 1st, 1871	19,080 00	
	27,588 00	27,588 00

GAS FUND.†

May 1st, 1870: By balance on hand	\$3,419 21	
Receipts for year ending April 30, 1871		3,277 94
Amount paid out for year ending April 30, 1871	\$3,357 60	
Balance on hand May 1st, 1871	3,339 55	
	6,697 15	6,697 15

DRAWING-BOARD AND TRIANGLE FUND.§

May 1st, 1870: By balance on hand	\$380 45	
Amount paid out for year ending April 30, 1871	\$165 58	
Balance on hand May 1st, 1871	214 87	
	380 45	380 45

MISCELLANEOUS FUND.||

May 1st, 1870: By balance on hand	\$148 76	
Receipts for year ending April 30, 1871		14 63
Amount paid out for year ending April 30, 1871	\$58 13	
Balance on hand May 1st, 1871	105 26	
	163 39	163 39
Balance		\$21,248 42
Total receipts		13,580 57
Total payments	\$12,089 31	
Total amount remaining on hand	22,739 68	
	34,828 99	34,828 99

* Each cadet has \$4 per month withheld from his pay, and the whole amount is returned to him when graduates or is discharged.

† Created by the payment of 25 cents per 100 cubic feet by all consumers excepting cadets, who pay 50 cents each per month.

§ Expended in the necessary production of gas and repairs to the gas-works.

|| This fund was created for the purpose of replacing drawing-boards, triangles, &c., destroyed by cadets, and is accrued by charging cadets with articles thus destroyed.

¶ Accumulation of fractional amounts on such expenditures are charged to the cadets *pro rata*, expended in books, &c., for office, postage on cadet muster-rolls, &c.

EXHIBIT No. 4.

Statement of money received and expended under each appropriation during the fiscal year ending June 30, 1871.

Heads of appropriations.	Balance unexpended June 30, 1870.	Appropriated for fiscal year ending June 30, 1871.	Received from other sources.	Available for fiscal year ending June 30, 1871.	Expended to include May 31, 1871.	Covered into the United States Treasury for tax, July 1, 1870.	Undrawn in United States Treasury.	On deposit with the Assistant Treasurer, New York.	Balance available for fiscal year ending June 30, 1871.
Current and ordinary expenses.	\$2,550 11			\$2,550 11					
Increase and expense of library.	1,301 62	\$2,600 00		3,301 62				\$1,147 19	\$1,147 19
Warning apparatus for academic buildings.	12,014 35			12,014 35				4,014 35	4,014 35
Forage for artillery and cavalry horses.	4,067 30			4,067 30				3,118 60	3,118 60
Gas-fires, gasometers, and repairs.	534 31	600 00		1,134 31				672 95	672 95
Models for the department of cavalry.	303 62			303 62				305 62	305 62
Furniture for the department of cavalry.	963 67	250 00		1,213 67				190 51	190 51
Targets and batteries for artillery exercise.	1,330 03			1,330 03				963 67	963 67
Supplying horses for cavalry and artillery practice.	843 76			843 76				1,330 03	1,330 03
Sewers for fuel for support, &c., barracks.	277 37			277 37				478 71	478 71
Repairs to officers' quarters.	324 54			324 54					
Iron grates for academic buildings.	277 37			277 37					
Mess-room and kitchen of General-hospital.	1,191 25	3,000 00		3,000 30				271 39	271 39
Purchase of fuel for mill and hall and shops.	1,875 78			1,875 78				293 45	293 45
Rebuilding academic building and barracks.	31,645 33		\$236 00	31,881 33				17,668 70	17,668 70
Removal and reconstruction of magazine.	309 30			309 30					
Ventilating and heating the barracks, &c.	2,025 49			2,025 49				1,165 37	1,165 37
Miscellaneous items and incidental expenses.	19 69			19 69					
Models for the department of engineering.	98 79	25,000 00		25,098 79					
Increasing supply of water.	117 57	100 00		217 57					
Fire-proof building for public offices.	5,139 61			5,139 61				5,139 61	5,139 61
Furniture for soldiers' hospital.	576 44			576 44					
Removal and enlargement of gas-works.	32 87			32 87					
Bread-height wall of water-battery.	1,423 40			1,423 40				711 80	711 80
Addition to soldiers' hospital.	2 87			2 87				5 40	5 40
Materials for quarters for subaltern officers.	4 89	1,000 00		1,004 89				1,977 34	1,977 34
Contingencies for superintendent.	2,025 46			2,025 46				45 12	45 12
Expenses of the board of visitors.	3,846 51			3,846 51				1,342 58	1,342 58
Enlarging, improving, and repairing cemetery.	2,500 00			2,500 00				2,500 00	2,500 00
Permanent dock on wharf.		25 00		25 00					
Repairs and improvements.		30 00 00		30 00 00				513 18	513 18
						\$2 71			

Fuel and apparatus	14,000 00	14,000 00	11,219 72	2,780 68	2,780 68
Forage for draught animals	1,200 00	1,200 00	1,200 00		
Postage and telegrams	200 00	200 00	121 00	70 00	70 00
Stationery	500 00	500 00	349 64	110 96	110 96
Transportation	1,200 00	1,200 00	833 60	366 40	366 40
New press, type, and materials for office and diplomas	1,200 00	1,200 00	796 47	503 53	503 53
Cadet-registers, class-reports, and blanks	1,200 00	1,200 00	154 00	45 10	45 10
Compensation to pressman and lithographer	100 00	100 00	75 00	25 00	25 00
Clerks to disbursing officers and quartermasters	1,650 00	1,650 00	1,500 79	137 50	137 50
Clerks to adjutants	1,500 00	1,500 00	1,373 92	125 00	125 00
Clerks to treasurers	1,500 00	1,500 00	1,165 00	335 00	335 00
For contingent expenses of the departments of mathematics, &c.	3,350 00	3,350 00	1,414 67	1,935 33	1,935 33
Miscellaneous incidental expenses	7,600 00	7,600 00	5,744 74	1,855 26	1,855 26
Departments of drawing, ethics, French, Spanish, chemistry, &c.	4,010 00	4,010 00	1,384 71	2,625 29	2,625 29
Repairs and additions to officers' quarters	3,000 00	3,000 00	2,630 70	369 30	369 30
Rebuilding the north wharf	7,000 00	7,000 00	7,000 00		
Grading, draining, and improving the artillery and cavalry drill-ground	2,000 00	2,000 00	2,000 00		
Repairing and putting new roof on cadet-quarters	50,000 00	50,000 00	3,997 61	6,002 39	6,002 39
Total	76,947 42	152,850 00	129,075 43	60,974 49	100,974 49

* Refunded by Morris, Tusker & Co. for labor.

T. G. FITCHER,
Brevet Brigadier General United States Army, Superintendent.UNITED STATES MILITARY ACADEMY,
West Point, N. Y., June 8, 1871.

REPORT OF COMMISSIONER OF BUREAU OF REFUGEEES FREEDMEN, AND ABANDONED LANDS.

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REPORT

OF THE

COMMISSIONER BUREAU REFUGEES, FREEDMEN, ETC.

WAR DEPARTMENT,
BUREAU REFUGEES, FREEDMEN, AND ABANDONED LANDS,
Washington, October 20, 1871.

SIR: I have the honor to submit the following report called for by act of Congress approved March 3, 1865.

The operations of this Bureau during the year have been restricted to the care of the hospital in this District, the collection and payment of bounties and other moneys due colored soldiers, and such supervision of the educational work as could be given, and such aid as could be rendered by counsel alone. The school funds having been all expended or promised previous to July, 1870, no new appropriations have been made, but old accounts and contracts for school buildings have been settled as far as possible.

To the numerous applications for help, I have been obliged to return only words of advice and encouragement. As no material aid could be granted for the support of schools, reports have not been asked from the teachers. I am not able, therefore, to give the statistics of schools, as in former years.

The collection and payment of bounties and other moneys due colored soldiers, sailors, and marines, in accordance with joint resolution of Congress approved March 29, 1867, have been continued, and this important work has employed nearly all the agents and clerks remaining on duty in this Bureau. The same vigilance and patient labor as in former years have been required to separate the true from the false claims, to discover and identify the claimants to whom money is due, and to protect them from fraud. The following table shows the work done in collecting claims:

Number of claims awaiting settlement at date of last annual report.....	3, 108
Number of claims received since that date.....	1, 012
Total	4, 120

Number of claims settled since date of last annual report.....	1, 128
Number of claims awaiting settlement August 31, 1871.....	2, 992
Total	4, 120

Total value of certificates received in settlement of claims filed by this Bureau since date of last annual report.....	\$56,581 79
Number of contested and doubtful claims filed by attorneys and referred to this Bureau for investigation since date of annual report.....	255
Number of discharge certificates (with letters of rejection) received for delivery to claimants in rejected cases, filed by attorneys.....	2, 838

Since the law of March, 1867, went into effect, 10,634 claims have been filed by this Bureau in the several Departments, and of these, 6,236 have been settled without cost to the claimants, excepting the necessary notarial fees. Had these claims been collected through claim-agents or attorneys, the amount of legal fees would have been \$62,360. This sum has been saved to the freedmen, and a much larger sum has been indirectly saved by their protection from fraud.

In addition to this gratuitous work of collecting claims, all certificates and checks issued by the Treasury Department in settlement of the claims of colored soldiers, sailors, or marines, or their heirs, are, in accordance with the law of March, 1867, "made payable to the Commissioner of the Freedmen's Bureau, who shall pay the agent or attorney his legal fees, and pay the balance to the claimant on satisfactory identification."

Each certificate and check when received is carefully compared with the record, and every precaution is taken to avoid mistake in making the payments. The following schedule shows the amount of money and the number of claims paid :

Balance of pay, bounty, and prize-money on hand August 31, 1870.....	\$1,027,694 16
Amount received from August 31, 1870, to August 31, 1871.....	490,769 13
Total.....	1,518,463 29
Amount paid claimants and attorneys during the year.....	734,432 55
Balance on hand August 31, 1871.....	784,030 74
Number of Treasury certificates and checks received during the year....	2,817
Number of claimants paid during the year.....	4,138
Total amount from the passage of the act March, 1867, to August 31, 1871. \$2,418,051 16	

Complaints are often made of delay in the settlement of bounty claims. In many cases such delay is caused by the failure of attorneys to furnish the necessary evidence to the Treasury Department. And when settlement is made, and the certificate sent to this Bureau, in some cases a considerable delay is unavoidable in the payment.

The small appropriation for this work has rendered it impossible to employ a sufficient number of agents to discover and identify the claimants, now scattered over the whole country, as promptly as could be desired.

In the Washington Hospital and Asylum, under the care of this Bureau, and supported by the Government, the number of patients treated during the year ending June 30, 1870, is shown by the following table:

TREATED.					DIED.					Per cent. of deaths.	REMAINING.				
Men.	Women.	Boys.	Girls.	Total.	Men.	Women.	Boys.	Girls.	Total.		Men.	Women.	Boys.	Girls.	Total.
652	677	141	187	1,657	65	54	8	14	141	.085	140	109	3	2	254

The majority of the patients now in hospital are so helpless from infirmity or extreme old age that they will require to be supported the remainder of their lives. The following statement exhibits fully their physical condition: Blind, 20; blind, deaf and dumb, 5; very old, 64; old and crippled, 55; loss of limbs, 6; paralysis, 15; idiotic and insane, 29; phthisis, 6.

The appropriation for the support of the hospital for the year ending June 30, 1872, contains the following provisions:

"That no part of said appropriation shall be used in the support of, or to pay any of the aforesaid expenses on account of any persons hereafter to be admitted to said hospital and asylum, unless persons removed thither from some other government hospital." In compliance with this law, no new patients have been admitted to be supported out of this appropriation, but arrangements have been made with the territorial government to assume the care and support of such sick and helpless people as may be sent to the hospital by the municipal authorities.

Besides the inmates of the hospital, there are nearly 100 aged people who draw each a ration from the Bureau, and who, though connected with the hospital, have quarters outside of the buildings.

These were nearly all slaves on the Arlington estate, and came here after the discontinuance of the Freedmen's Village Asylum, but there was not room for them in the hospital buildings.

In the Colored Orphan Asylum (also connected with the hospital in all estimates and appropriations) in this District there are 52 boys, 24 girls, 24 old women, and 1 old man: total, 101. These receive medical attendance and rations from the hospital.

From these statements it will appear that there are 420 persons connected with the hospital dependent upon the Government for their support and for medical attendance, and for whom I trust Congress will continue to make suitable provisions.

The number of officers, agents, and clerks now on duty is 54, a reduction of 33 since the date of the last report. Of these 38 are employed in the office in Washington.

In conducting the business of the office the number of letters received during the year is 15,997, and of letters copied and sent 16,442.

The following is an exhibit of the financial operations of the Bureau for the year ending August 31, 1871:

APPROPRIATION FUND.

Balance on hand August 31, 1870.....	\$182,561 66
Appropriation deficiency for the year ending June 30, 1871.....	127,000 00
Appropriation bounty for the year ending June 30, 1872.....	87,500 00
Appropriation medical department for the year ending June 30, 1872....	78,000 00
Total	475,061 66
Expenditures:	
Salaries of agents.....	\$23,886 08
Salaries of clerks.....	21,923 64
Stationery and printing.....	7,126 59
Quarters and fuel.....	9,624 30
Medical department.....	29,979 24
Commissary stores.....	42,456 40
Transportation of officers and agents.....	11,085 51
Superintendent of schools.....	1,100 00
Schools and asylums, construction, rental and repairs.....	112,527 26
Telegraphing and postage.....	674 64
Collection and payment of bounties.....	98,708 72
Total.....	362,263 42
Balance on hand August 31, 1871.....	112,798 24

REFUGEES AND FREEDMEN'S FUND.

Balance on hand August 31, 1870.....	\$2, 430 79
Received from auction sales of office furniture.....	694 03
Received from subsistence stores refunded by planters.....	1, 211 68
Total	4, 336 50
Expenditures:	
For schools	\$4, 336 50

SCHOOL FUND.

Arising from the sale of so-called confederate property under section 12, public act No. 114, of July 16, 1866:	
Balance on hand August 31, 1870.....	\$15, 154 17
Amount received during the year.....	5, 780 00
Total	20, 934 17
Expenditures:	
For salaries of teachers and rent of school-buildings.....	\$20, 934 17

I herewith forward an estimate for appropriations to defray the expenses of this Bureau for the fiscal year ending June 30, 1873. But I recommend that the appropriations for the hospital and asylum be intrusted to the proper officers of the territorial government of the District of Columbia, and that that government be required to assume the care and support of the hospital on and after July 1, 1872. I also recommend that the payment of bounties and other moneys due colored soldiers, sailors and marines, or their heirs, be transferred to the Pay Department of the Army, under such regulations for the protection of claimants as the Secretary of War may prescribe, on the 1st of July, 1872, and that this Bureau be closed and its records be turned over to such officer as the Secretary of War may designate.

Very respectfully, your obedient servant,

O. O. HOWARD,

Brigadier General, U. S. A., Commissioner.

The Honorable SECRETARY OF WAR.

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